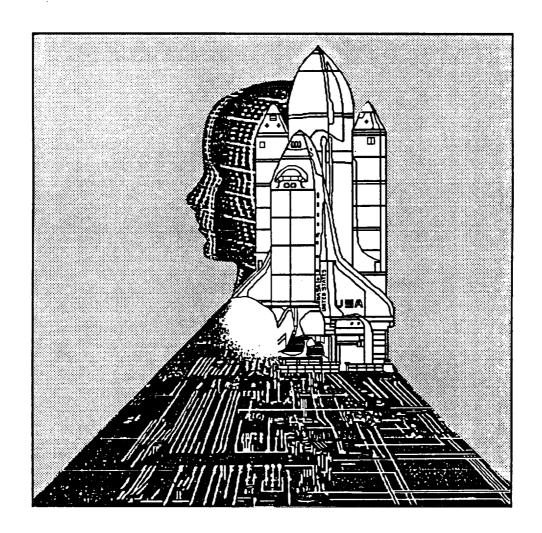
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Shuttle Ground Operations Efficiencies/Technologies Study

AEROSPACE OPERATIONS



TECHNICAL INFORMATION SHEETS (TIS)
VOLUME 5 of 5

FINAL REPORT - Phase 1



KENNEDY SPACE CENTER

NAS10-11344

May 4, 1987

(NASA-CR-180565) SHUTTLE GFCUND OPERATIONS FFFICIENCIES/TECHNOLOGIES STULY (SGOE/T). VOLUME 5: TECHNICAL INFORMATION SHEETS (TIS)

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SHUTTLE GROUND OPERATIONS EFFICIENCIES/TECHNOLOGIES STUDY

TECHNICAL INFORMATION SHEETS

FINAL REPORT - VOL 5 - PHASE 1 -MAY 4, 1987

KENNEDY SPACE CENTER
NAS10-11344

BOEING

A.L. Scholz
Study Manager
M. T. Hart
Dep. Study Manager

NASA

W.J. Dickinson
Study Manager

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SPACE SHUTTLE GROUND OPERATIONS EFFICIENCIES/TECHNOLOGIES STUDY PHASE 1 FINAL REPORT

The final report for the Shuttle Ground Operations Efficiencies/Technologies Study is made up of five volumes.

Volume 1	Executive Summary
Volume 2	Ground Operations Evaluation
Volume 3	Final Presentation Material
Volume 4	Preliminary Issues Database (PIDB)
Volume 5	Technology Information Sheets (TIS)

Volume 1

The Executive Summary volume provides a brief overview of the major elements of the Study, reviews the findings, and reflects the development of the recommendations resulting from the Study.

Volume 2

The Ground Operations Evaluation volume describes the breath and depth of the various Study elements selected as a result of an operational analysis conducted during the early part of the Study. Analysis techniques used for the evaluation are described in detail. Elements selected for further evaluation are identified; the results of the analysis documented; and a follow-on course of action recommended. The background and rationale for developing recommendations for the current Shuttle or for future programs is presented.

Volume 3

The Final Presentation Material volume contains the most recent version of the charts used in the Final Phase 1 Oral Briefing at KSC on April 6, 1987, and to the STAS (Space Transportation Architecture Study) IPR-5 (Interim Program Review) held at MSFC on April 8, 1987. The KSC, April 6 notation in the title block was used for both packages because the reviews were held so closely together. This volume contains all charts in their final form and any differences from charts presented are minor.

Volume 4

The Preliminary Issues Database (PIDB) was assembled very early in the Study as one of the fundamental tools to be used throughout the Study. Data was acquired from a variety of sources and compiled in such a way that the data could be easily sorted in accordance with a number of different analytical objectives. The system was computerized to significantly expedite sorting and make it more usable. This volume summarizes the information contained in the PIDB and provides the reader with the capability to manually find items of interest. How that information was used in this Study is explained in greater detail in Volumes 2 and 3.

Volume 5

The Technology Information Sheet volume was assembled in database format during Phase 1 of the Study. This document was designed to provide a repository for information pertaining to 144 OMI (Operations and Maintenance Instructions) controlled operations in the OPF, VAB and PAD. It provides a way to accumulate information about required crew sizes, operations task time duration (serial and/or parallel), special GSE required, and identification of a potential application of existing technology — or the need for the development of a new technology item.

	•		
		•	

TECHNOLOGY IDENTIFICATION SHEETS

The Technology Identification Sheet (TIS) is an expanded version of the Resource Identification Sheet (RIS) that was in the original Study Plan. The TIS contains a description of the activity, location, facility and equipment requirements, hazard level, subtask procedures and manpower requirements. In addition, it now contains vehicle power requirement, LCC Support requirement, associated issues, technology needs, and technology candidates. Each task has been assigned a task sequence number to provide for downstream manipulation.

The manhour and headcount data on the TIS Sheets are incomplete because the data was not obtainable from the SPC or NASA. Technician data for the OPF was the only data made available and is incorporated.

The "Technology Need" and "Technology Candidates" descriptions have been completed only for the seven technology tentpoles identified in the study.

The TIS sequence task number was used to group the OMI's by usage location, i.e.,

1 - 88 are the top level OMI's performed in the OPF
100 - 111 are the top level OMI's performed in the VAB
200 - 213 are the top level OMI's performed at the PAD
300 - 305 are examples of spacecraft support OMI's at the PAD
401 - 423 are the top level OMI's performed in the ET checkout cell.

The Technology Identification Sheet Database consists of up to four entry screens. The printed sheets combine the most significant information into one sheet per task number. All of the information on the first screen is printed. The second screen contains the GSE equipment required. The equipment nomenclature is omitted from the GSE equipment entries on the second screen, but the part number is printed. The third and fourth screens contain space for the technology need description and the technology candidates identified and is printed in its entirety.

A sample of the printout appears on the next page with an explanation of all the fields.

OMI N	0:[4]		Facility: OMI Title:	[ACTUA	L TITLE	PRINTED	ON OMI]
Subta	sk OMI(s):	[5]	,	,		,	,
			,	,		,	
Drana	, guidite Tas	k OMI:	,	· · · · · · · · · · · · · · · · · · ·		,	
Hazar	d: Level:	[7]	Vehicle Pow	er Require	d: LCC	Support	Required: .
GSE:	[8]	,			,		,
	,		,	,			•
			*** **********************************	ON OF OMI	△₽₽₽₩₽₹€	ראר	
Activ	<u>lty Descrip</u>	tion:[bai	EF DESCRIFII	ON OF OMI	OFEMALL		
			· · · · · · · · · · · · · · · ·				
	nnel:	Head Count		Remarks			
<u> </u>	lech. Tech: lec. Tech:	(e)	[10]	(ii)			
	Muality:	[0]	[10]				
	CC Ops:	• •					
	upport:						
_	ngineering:	• •			m	F107	
Total	<u>:</u>	• •			Time:	. [12]	
Techr	ology Need	Description:					
		IS AREA TO E	E USED FOR A	ny needs f	OR IMPRO	OVEMENT]	
						. .	
Toobs	ology Candi	dates Identi	fied:				
160111	CIORY CONC.						
	[THIS AREA TO	O BE USED FO OLOGY IMPROV	EMENT POSS	IBILITIE	es)	
		г] NOTE				· · · · · · · · · · · · · · · · · · ·
[1]	AN INTERNAL	LY ASSIGNED	NUMBER USED	BY STUDY T	EAM.		
[2]	USAGE LOCAT	'ION SUCH AS	OPF, VAB OR	THE PAD.			
[3]			OMI REVISION				
[4]	OMI NUMBER	AS IT APPEAR	S ON DOCUMEN	T.	משתונו דו	DEUTEW	
[5]	14 MOST SIG	INTETICANT SUB	TASK OMIS LI PERFORMED B	STED IN OR	S UNE CVI	REVIEW.	
[6] [7]	HAZARDOUS ~	YES OR NO.	LEVEL OF HAZ OR NO, AND L	ARD , VEHI	CLE POWE	ER NECESS	ARY TO YES OR NO.
[8]	8 MOST SIGN	IFICANT GSE	EQUIPMENT SE	TS REQUIRE	D FOR PE	ERFORMANC	E OF THIS OMI
[9]	MAXIMUM NUM	BER OF PERSO	NS REQUIRED	TO PERFORM	OMI.		
[10]	HOURS REQUI	RED BY THIS	CATEGORY.			NIITA MACE	
[11]	N/A WILL AF	PPEAR IF NO I	NFORMATION W	MUTC OMT	SLE FOR T	THIS TASK	•
[12] [13]	LENGTH OF T PRELIMINARY	TIME REQUIRED SISSUES DATA	TO PERFORM BASE ISSUES	IDENTIFIE	D DURING	G REVIEW	OF THIS OMI.

<u>Seg. Task No</u> : 1.000	Facility: O	PF O	MI Page Count: 735
<u>041 No</u> : V1002	OMI Title:	SHUTTLE LANDING-F	POST LANDING CONVOY
OPERATIONS -KSC (LPS)			
<u>Subtask CMI(s)</u> : I2004	, 13012	. QZØ53	
06051 , Y3109	, V3528	. V3537	. V1091
V3521	ŋ	4	: a
Prerequisite Task OMI:		·	·
<u>Hazard:</u> Y <u>Level</u> :	<u>Vehicle</u> Power	Required: Y LCC	D <mark>Support</mark> Required:
<u>085</u> : 170-0891 , C70-1			70-1218 .
970-1224 , 97 0- 0508	, 870-053	4 , P72-100	
•	, , , , , , , , , , , , , , , , , , ,	, , , , , , , , , , , , , , , , , , , ,	

Activity Description: TO PROVIDE OVERALL CONTROL OF ALL RELATED ACTIVITIES DURING ANY LANDING OPERATIONS AND DETAILED PREPLANNED APPROVED ACTIONS AUTHORIZED IN THE EVENT OF ANY EMERGENCY OR CONTINGENCY.

Parsonnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	27	162.0			
<u>Elec. Tech</u> :	4	24.0			
<u>Quality:</u>	Ø	0.0	N/A		
L <u>CC Ops</u> :	Ø	Ø. Ø	NZA		
<u>Support</u> :	Ø	$\langle \overline{V} \rangle$, $\langle \overline{V} \rangle$	NZA		
<u>Engineering</u> :	Ø	20.0	NZA		
<u>Total</u> :	31	186.0		Time:	6.0
Issues:	11 m		n u		n 4

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

<u>Seq. Task No</u> : 2.000 <u>OMI No</u> : V5099	ð <u>Facility</u> : <u>OMI Title</u> :	OPF ORBITER SPOT	OMI <u>Page Count</u> : 82 TING, LIFTING AND
LEVELING			и
<u>Gubtask GMI(s)</u> : V3508	7	*	,
7	ij	9	7
3	9	y	٧
<u>Prerequisite Task OMI:</u> <u>Hazard:</u> Y <u>Level:</u> <u>GSE</u> : H70-0570 ,		<u>er Required</u> : N A70-0600	LCC Support Required: , H70-0508 ,
P72-1001 ,	9)	

Activity Description: PREPARE ORBITER FOR NORMAL MAINTENANCE BY LIFTING AND LEVELING ORBITER ZO 400 AT 253 INCHES OFF OPF FLOOR, USING ORBITER PLATFORM LIFT SYSTEM.

Personnel:	<u>Head Count</u>	Man Hours	<u>Remarks</u>		
Mech. Tech:	1.4	56.0			
Elec. Techs	Ø	Ø . Ø	NZA		
Quality:	(2)	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	(2)	Ø.Ø	N/A		
Engineering:	Ø	0.0	N/A		
Total:	14	56.0		Timea	4.13

lesties:

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

:1 3

 Seq. Task No:
 3.000
 Facility:
 OPF
 OMI Page Count:
 1167

 OMI No:
 V1158
 OMI Title:
 OMS/RCS DESERVICING(LFS)

 Subtask OMI(s):
 V3511
 , 03415
 , W3103
 ,

 .
 .
 .
 .
 .

 Prerequisite Task OMI:
 .
 .
 .
 .

 Hazard:
 Y Level:
 Vehicle Power Required:
 Y LCC Support Required:
 Y CC Support Required:

 GSE:
 S70-0784-XX
 , 870-0865-XX
 , A70-0671-044
 , A70-0672-XX

Activity Description: PERFORM OPF ORBITER DESERVICING OF FRCS AND OMS POD/XFD SYSTEM FOLLOWING FLIGHT. DESERVICING WILL OFF LOAD EXCESS PROPELLANT FROM TANKS, AND DRAIN AND PURGE PROPELLANT DISTRIBUTION SYSTEM TO PREPARE OMS/XFD SYSTEM AND FRCS FOR PRE-FLIGHT SERVICING OR REMOVAL FROM ORBITER.

A70-1084 , F70-0031-02 , S70-0679-XX , S70-0695-XX

<u>Personnel:</u>	Head Coun	<u>t Man Hours</u>	<u>Remarks</u>	
<u>Mech. Tech:</u>	<u></u>	168.0		
Elec. Tech:	3	168.0		
Quality:	(2)	Ø.Ø	NZA	
LCC Ops:	Ø	Ø.Ø	NZA	
Supports	⟨∕∂	Ø.Ø	NZA	
Engineering:	Ø	Ø.Ø	NZA	
<u>Total:</u>	۵.	336.0	Time:	34.2
Issues: DESIGN C	RITERIA :/	AUTOMATION	:COST/MANHOURS	: ACCESSARILITY

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

Sag. Task No: OMI No: V9721 DEACTIVATION	4.000	Facility: OMI Title:		OMI <u>Page Count</u> : PURGE ACTIVATION/	150
<u>Subtask OMI(s):</u>		,	ŋ.	ų	
9		7	7	Ÿ	
grand and the second se	File T	,	1	7	

Prerequisite Task OMI:

 Hazard: Y Level:
 Vehicle Power Required: N LCC Support Required: N

 23E: F7@ 0031-001(2), S70-0570-3(SLS), S70-0784-11(12), S70-0965-XX
 ,
 572-0858-XX , S70-1228-1(2) , S70-0700-XX ,

Activity Description: TO PERFORM NECESSARY OPERATIONS TO SUPPORT THE OME TRICKLE PURGE MOOKUP, ACTIVATION, DEACTIVATION.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	erry. Like	24.2			
Elec. Tech:	(2)	Ø. Ø	N/A		
Quality:	(2)	20.20	NZA		
LCC Ops:	(2)	2.0	NZA		
Support:	2	Ø. Ø	NZA		
<u>Sngineering</u> :	@	Ø.12	NZA		
	erry afai	24.2		Timel	12.7
V	a		13		q
1 5 014 69 91 2	2		п		:

Technology Need Description:

<u>Seq. Task Not</u> 5.000 <u>Omi No</u> : V1091	<u>Facility:</u> OFF <u>OMI Title</u> : OF	: <u>O</u> RBITER PRSD CRY(<u>ci Page Dours</u> : 407 3 BRAIN (LPE)
<u>Subtask OMI(s): V3543</u> V3512 , V3515 V7016 , I3117 Energuisite Task OMI:	, V3502 , V5033 , M2083	, V3507 , V5034 , 03415	, VS511 , V9201711 ,
Hazard: Y <u>Level:</u> <u>696</u> : C70-0685 , C70- 370-0590 , 370-0786-	Ø699 , C7Ø		

Gotivity Description: TO PROVIDE INSTRUCTIONS TO DETANK AND INERT ORBITER PRED LO2 AND LH2 TANKS AT OPF USING LPS.

Paraonnel:	<u> Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	4	192.0			
Elec. Tech:	12 0	Ø.0	NZA		
Quality:	Ø	Ø. Ø	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	(7)	Ø.Ø	N/A		
Total:	4	192.0		lime:	48.2

Issues: DESIGN CRITERIA : COST/MANHOURS :

Technology Need Description: DEVELOP NEW, HIGH POWER-DENSITY FUEL CELLS OF BATTERIES THAT REQUIRE SIGNICANTLY LESS ON-LINEMAINTENANCE THAN THE CURRENT FUEL CELL SYSTEM. REPLACE THE CURRENT FUEL CELLS.

Technology Candidates Identified:

EARLY CAMDIDATES APPEAR TO SE:

- 1. ALKALINE/ALKALINE REGENERATIVE FUEL CELL SYSTEM (RFCS)
- 2. INDIVIDUAL PRESSURE VESSEL (IPU) NI-H2 HATTERY
- 3. MAS BATTERIES (LONG TERM)
- 4. LI/SOCL2 BATTERIES (LONG TERM)

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<u>Seq. Task No:</u> <u>OMI No</u> : V5432	6.000 Facili OMI Ti	Marie WAL	<u>OMI Page Count</u> AL AND SYSTEM SAFIR	
Subtask OMI(s):	,	3	4	
Ť	9	9	7	
9	à	y	7	
<u>Prerequisite Task</u>			•	
Hazard: Y <u>Level</u> :	<u>Vehicle</u>	<u> Power Required:</u>	N LCC Support Sec	<u>puired:</u> N
<u>69E</u> : H70-0565-2 S	N2 , H72-1006 SN1	, A72-1014	, E70-0011	4
H72-1003 ,	H72-1005 ,	9		

Activity Description: TO REMOVE EXPENDED PYRO DEVICES AND SECURE CONTINGENCY PYRO SYSTEMS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	3	24.0			
Elec. Tech:	3	24.0			
Quality:	Ø	Ø. Ø	N/A		
LCC Ops:	Ø	0.0	NZA		
Support:	Ø	∅.∅	N/A		
Engineering:	Ø	0.0	N/A		
<u>Total</u> :	55	48.0		Time:	8.0
Incuracy :	B. 17		:s #		2 9 15

Technology Need Description:

<u>Seq. Task No:</u> 7.000 <u>OMI No</u> : V5057	<u>Facility:</u> <u>OMI Title</u> :	OPF TYC/SSME GSE	OMI Page Count: 201 INSTALLATION/REMOVAL	
<u>Subtask OMI(s)</u> : V2270	, V3508	, V3512	ų	5
3	ģ	₹	5	
,	5	7	ī	
<u>Prerequisite Task OMI:</u> <u>Hazard: N Level:</u> <u>GSE:</u> A70-0501 , A70-0 M70-0021 , M70-0024		170-1056	<u>LCC Support Required:</u> , H70-0629	M

Activity Description: TO PROVIDE OPERATIONAL INSTRUCTIONS FOR INSTALLATION, USE AND REMOVAL OF LISTED GSE TO SUPPORT SSME, HYDRAULIC OR GN&C SUBSYSTEM TESTING.

<u>Parsonnel:</u>	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	4 Ø	32.0 Ø.0	N/A		
<u>Elec. Tech</u> : Quality:	va va	Ø. Ø	NZA		
LCC Ops:	2	Ø.Ø	NZA		
<u>Support</u> :	<u>(2)</u>	Ø.Ø	N/A N/A		
<u>Engineering</u> :	2) 4	Ø.Ø 32.Ø	147 Fri	Time:	12.2
Totali	*7	# V			
Issues:	च प्र		2		ŭ.

<u>Technology Need Description:</u>

Seq. Task No: 8.000 Facility: OFF
OMI No: V5003 OMI Title: ORBITER FERRY OMI Page Count: 25 OMI Title: ORBITER FERRY KIT REMOVAL AND

PREPARATIONS FOR ORBITER ACCESS

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y <u>Level: Vehicle Power Required:</u> N <u>LCC Support Required:</u> N <u>SSE: A70-0603 , A70-0657 , A70-0672-XX , A70-0702 , A70-0796 , A70-0797 , A70-0971 , A70-1011</u>

Activity Description: TO REMOVE ORBITER FERRY KIT AND PREPARE ORBITER FOR ACCESS

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
<u>Meih. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Elec. Tach</u> :	Ø	Ø.Ø	NZA		
<u>Quality</u> :	Ø	0.0	NZA		
_CC Ops:	Ø	Ø.Ø	NZA		
<u>Support:</u>	Ø	Ø. Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	Ø	0.0		Times	Ø . Ø

Issues: ACCESSABILITY :

Technology Need Description:

<u>Seg. Task No:</u> 9.000 <u>CMI No</u> : V5017	<u>Facility:</u> <u>OMI Title</u> :	OPF CREW SYSTEMS	OMI <u>Page Count</u> : DESTOWAGE	446
<u>Subtask DMI(s)</u> : V6024	, V5Ø67	•	7	ı
Ť	9	7	7	7
5	,	9	9	
<u>Prerequisite Task OMI:</u> <u>Hazard: Y Level:</u> <u>GSE:</u> A70-0541 , P70- A70-0712 , A70-0796	**************************************	<u>er Required</u> : N 270-0806 '	<u>LCC Support Requi</u> , H7 0-0 857	<u>red</u> : N

Activity Description: REMOVE CREW SYSTEMS EQUIPMENT FROM ORBITER AFTER THE COMPLETION OF A MISSION.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	6	48.Ø			
Elec. Tech:	2	16.0			
Quality:	Ø	Ø. Ø	NZA		
LCC Ops:	Ø	Ø. Ø	N/A		
Support:	Ø	Ø. Ø	N/A		
Engineerings	Ø	Ø . Ø	N/A		
	8	64.Ø		Time:	8.9
Isaues:	# 		ts 11		n ÷

Technology Need Description:

Technology Candidates Identified:

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 Seq. Task No:
 10.000
 Facility:
 OPF
 OMI Page Count:
 1367

 OMI No:
 V9001VL1-VL4
 OMI Title:
 ORBITER POWER UP/DOWN-OFF(OPF)

 Subtask OMI(s):
 V3500
 V3502
 V3507
 V3512

 V118A
 C2008
 Value
 Value

 Prerecuisite Task OMI:
 Vehicle Fower Required:
 Y
 LCC Support Required:
 Y

 GSE:
 C70-0807
 C72-1079
 C72-1250
 S70-0898-1
 S70-0898-1
 S70-0812

Activity Description: PROVIDE STANDARD INSTRUCTIONS FOR ORBITER POWER UP AND DOWN INCLUDING THE GSE REQUIRED FOR THE BASIC SUPPORT SYSTEMS, I.E. EPP&C, INSTRUMENTATION, ECLSS AND DPS.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	Ø	Ø . Ø	N/A		
Elec. Tech:	4	Ø.Ø	N/A		
<u>Quality</u> :	3	0.0	NZA		
LCC Ops:	6	Ø. Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	Ø	(2) . (2)	N/A		
Tctal:	13	Ø. Ø	<u> Time</u>	3 Ø. Ø	
<u>lssues</u> : DESIGN C	RITERIA :0	DST/MANFOWER	REQUIREMENT	S :EXPERT	SYETEM

Technology Need Description:

<u>Seq. Task No</u> : 11.000 <u>OMI No</u> : V5012	Facility: OMI Title:	OPF CRDNANCE INSTALL	<u>MI Page Count</u> : ATION AND CHECKO	
(LPS) <u>Subtask OMI(s)</u> : S3500 V9001 , V9002.07	, S6005 , V9024	, V1Ø86 ?	, V3502 ,	7
Prerequisite Task OMI: Hazard: Y <u>Level</u> : GSE: H72-1003 , C72-1 H72-1005 , E70-0011	127-2 , [r <u>Required</u> : Y <u>LC</u> 272-1128 , 4 365-02 , H72-12	CC Support Requir 072-1014 ,	<u>ed</u> : Y

Activity Description: INSTALL AND ELECTRICALLY CONNECT ORBITER ORDANANCE IN THE OPE.

Personnel:	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	5	148.0			
Elec. Tech:	6	164.2			
Guality:	\bigcirc	Ø.Ø	A \ N		
LCC Ops;	Ø	Ø.Ø	NZA		
Support:	Ø	Ø. Ø	N/A		
Engineering:	Ø	Ø.Ø	N/A		
Total:	1.1	312.0		<u>Time</u> :	4名。②
<u>Issues</u> : SAFETY	e 3		" "		:

Technology Need Description: REPLACE ORDNANCE DEVICES WITH NON-EXPLOSIVE DEVICES.

Technology Candidates Identified: NITINOL APPLICATION (MITINOL - A NICKEL-TITANIUM "MEMORY" ALLOY, CAN BE MECHANICALL DEFORMED AND THEN RETURNED TO ORIGINAL SHAPE BY HEAT WHILE EXERTING UP TO 300K PSI).

<u>Technology Identification</u> Sheet

Facility: OFF OM! Page Count: 149 <u>Seq. Task No</u>: 12.000 OMI No: VII84 OMI Title: ORBITER S/W GPC AND MMU READ/WRITE PROCEDURES (LPS) Subtask OMI(s): Prerequisite Task OMI: <u>Vehicle Power Required:</u> Y <u>LCC Support Required:</u> . Hazard: N Level: GSE:

Activity Description: TO LOAD, PATCH, DUMP, AND COMPARE SOFTWARE FROM THE MASS MEMORY UNITS OR GPC'S.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u> Mech. Tech:</u>	T.	36.0			
Elec. Tech:	3	40.0			
Quality:	Ø	Ø.Ø	N/A		
LOC Ops:	Ø	0.0	NZA		
<u>Support</u> :	②	0.0	NZA		
<u>Engineering</u> :	Ø	Ø.Ø	NZA		
Trutation 1	6	76.0		Times	16.7

<u>Issues</u>: TIME/ON-LINE : REQUIREMENTS :

Technology Need Description:

Seg. Task No: 13.000 Facility: OPF OMI Page Count: 142
CMI No: V1200 OMI Title: ORBITER FLIGHT RECORDER DUMP TO GSE
DURING POST LANDING OPERATIONS

; Prerequisite Task OMI:

Activity Description:ORBITER OPS 1, OPS 2 AND PAYLOAD RECORDER DUMP TO GSE DURING POST LANDING OPS TO RETRIEVE FLIGHT DATA FROM THE ORBITER OPS AND PAYLOAD FLIGHT TAPE RECORDER.

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	1	12.0			
Elec. Tech:	4	48.Ø			
Quality:	Ø	Ø.Ø	NZA		
CCC Ops:	Ø	Ø. Ø	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	5	60.Ø		Time:	12.V

<u>labues</u>: FAULT DETECTION :REQUIREMENTS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

 Seq. Task No:
 14.000
 Facility:
 OPF
 OMI Page Count:
 139

 OMI No:
 V1084.01-.03
 OMI Title:
 CAUTION AND WARNING TURNAROUND

 VERIFICATION (LPS)
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Vehicle Power Required: Y LCC Support Required: Y

Activity Description: PERFORM ANNUNCIATOR AND TONE CHECKS BETWEEN EACH FLIGHT.

Personnel: Head Count Man Hours Remarks Mech. Tech: 1 4.0 Elec. Tech: 3 12.0 62) Ø.Ø NZA Quality: LCC Ops: Ø 0.0 NZA Support: Ø Ø.Ø MZA Ø 0.0 NZA <u>Engineering</u>: 4 <u>Time</u>: 4.2 16.0 Total: <u>Issues</u>: DESIGN :FAULT DETECTION :RELIABILITY :

Technology Need Description:

Hazard: N Level:

GSE:

SEE TIS 57 (V1203)

Technology Candidates Identified:

SEE TIS 57 (91003)

Seg. Task <u>No</u> : 15.000 <u>OMI No</u> : V5043VL1-V L 3	Facility: OMI Title:		<u>OMI faqo Count</u> : 17 D INSTALLATION ANI	
REMOVAL <u>Subtask OMI(s)</u> : V3508 V5057 , V1007	, V3512	, V3511	, V2272	
Prerequisite Task OMI:	5	,	,	
<u>Hazard: Y Level</u> : <u>GSE</u> : M70-0028-1 , H70-6 A72-1323 , H70-0588	<u>Vehicle Powe</u> 2855-1 , H		<u>CC Support Requies</u> H70-0541-02 ;	: M

Activity Description: PROVIDE INSTRUCTIONS FOR INSTALLATION AND/OR REMOVAL OF SEME MOUNTED AND ORBITER MOUNTED HEAT SHIELD SEGMENTS.

<u>Personnel:</u> Mech. Tech:	<u>Head Count</u> 15	<u>Man Hours</u> 1440.0	<u>Remarks</u>		
Elec. Tech:	2	192.0			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	②.②	N/A		
Support:	Ø	0.0	NZA		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		en e en
<u>Total</u> :	17	1632.0		Time:	76. Ø
<u>Issues</u> : DESIGN	; T]	ME/ON-LINE	:COST/MA	ANHOURS	:ACCESSABILITY

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Fower Required: N LCC Support Required: N

<u>68E</u>: C72-1109 , C72-1127-2 ,

Activity Description: TO PROVIDE DISASSEMBLY, BATTERY PACK REMOVAL, ASSEMBLY AND CHECKOUT INSTRUCTIONS FOR ORBITER AFT FUSELAGE GAS SAMPLES.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:		12.0			
Elec. Tech:	Ø	Ø.Ø	NZA		
<u>Quality:</u>	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	2)	Ø. Ø	N/A		
Engineering:	Ø	Ø.Ø	NZA		
retali	<u></u>	12.0		<u>Time</u> :	4.2
Issues:	:		2		: :

Technology Need Description:

Seg. Task No: 17.000 Facility: OPF OMI Page Count: 1030
OMI No: V1011.01-.07 OMI Title: SSME ENGINE LEAK AND FUNCTIONAL (LPS)

Subtask OMI(s): V1171 , V9001VL4 , V9002VL1

Prerequisite Task OMI:

<u>Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y C70-0743-XX , S70-0695-XX , Z70-0018-04 , A34-0329030</u>

Activity Description: ACCOMPLISH THE FOLLOWING: HPFTP & MCC DRYING, TURBOPUMP INT. CHECKS; INT/EXT INSPECTION OF MAJOR COMP'S; INTEGRITY OF HE FLUID SYS; VERIFY INTEGRITY OF SSME HGM, LOX, & LH2 FLUID SYS'S; PNUEMATIC CHECKOUT & LEAS. CHECKS & ROUTINE MODULE CHECKOUT OF SSME'S; AND OFERATIONAL INTEGRITY OF ALL SSME/ORBITER FLUID & ELECTRICAL INTERFACES FOLLOWING 10 ENGINE STARTS.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	9	1320.0			
Elec. Tech:	3	744.0			
Quality:	(Z)	Ø.Ø	N/A		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	NZA		
Total:	12	2064.0		Timet	252.0

Issues: DESIGN CRITERIA : REQUIREMENTS : COST/MANPOWER : RELIABILITY

Technology Need Description:

Activity Description: TO DETERMINE ORBITER ROLL, PITCH AND YAW ANGLES

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	0.0	N/A		
Elec. Tech:	\bigcirc	Ø. Ø	NZA		
Quality:	Ø	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	0.0	NZA		
Total:	Ø	Ø. Ø		<u>Time</u> :	4.0

<u>Issues</u>: TIME/ON-LINE :

Technology Need Description:

 Sog. Task No:
 19.000
 Facility:
 OPF
 CMI Page Count:
 648

 OMI No:
 V5006.01-.03
 OMI Title:
 PAYLOAD BAY DOOR OPENING TO 145 OR

 160 DEGREE MAINTENANCE POSITION (LPS)
 , V9001VL1
 , S3500

 Subtask OMI(s):
 Q3110
 , V3508
 , V9001VL1
 , S3500

 V6034
 , V9001VL1
 , S3500
 , V9001VL1
 , S3500

 Prerequisite Task OMI:
 , V9001VL1
 , S3500
 , C70000

 Hazard:
 Y Level:
 Vehicle Power Required:
 Y LCC Support Required:
 Y LCC Supp

Activity Description: POSITION PAYLOAD DOORS TO THE 145 OR 160 DEGREE MAINTENANCE POSITION TO ALLOW ACCESS TO THE PAYLOAD BAY, RADIATOR MECHANISMS, ETC.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	8	96.0			
Elec. Tech:	Ø	Ø.Ø	N/A		
Guality:	Ø	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø. Ø	NZA		
Engineering:	Ø	Ø.Ø	N/A		
Total:	8	96.Ø		Time:	12.0
<u>Issues</u> : ACCESSAB	LILTY : DE	SIGN	:REQUIRE	MENTS	:TIME/OM-LINE

Technology Need Description:

Seq. Task No:

20.000

Facility: OFF

OMI Page Count:

OMI No: V1173 OMI Title: REMOTE MANIPULATOR POSITIONING MECHANISM STOW/DEPOLY VERTICAL/HORIZONTAL

<u>Subtask OMI(s)</u>: V9001VL1

 $Z_k \mathbb{Q}$

Prerequisite Task OMI:

Hazard: N Level:

Vehicle Power Required: Y LCC Support Required: Y

GSE:

Activity Description: TO STOW OR DEPLOY THE RMPM/RMS TO FACILITATE ACCESS TO PAYLOAD BAY AREA.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	2	6. Ø			
Elec. Tech:	3	9.0			
<u>Quality</u> :	Ø	0.0	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support:</u>	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
Total:	5	15.Ø		Time:	3.0

Issues: DESIGN CRITERIA : FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

<u>Seq. Task No</u> : 21.000 <u>OMI No</u> : V1009.0105	<u>Facility:</u> <u>OMI Title</u> :	OPF MPS LEAK AND	<u>OMI Face Count</u> : 185(FUNCTIONAL TEST (LPS)	3
Subtask OMI(s): V1171	, 53500	, V3502	, V9001	,
7	"	7	y	7
y	9	ų.	9	
<u>Prerecuisite Task OMI:</u> <u>Hazard:</u> Y <u>Level:</u> <u>GSE:</u> C70-0903 , C72- A70-0702 , C70-0807	1227 , [<u>LCC Support Required</u> , E70-0036 -0695-2,-8	n M

Activity Description: TO INSPECT THE 1000 MICRON SCREENS IN THE MAIN ENGINE FEED LINES AT THE OUTLET SIDE OF THE PREVALVES; PERFORM TIP LOAD AND FLAPPER ANGLE MEASUREMENTS ON THE 17 IN. QD'S AND VERIFY MPS COPPER PATHS, COMPONENT AND ELECTRICAL CHECKS.

Fersonnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks			
Mech. Tech:	5	132 0. 0				
Elec. Tech:	3	792.Ø				
Quality:	2	Ø. Ø	N/A			
LCC Ops:	Ø	Ø.Ø	N/A			
Support:	Ø	Ø. Ø	ANA			
Engineering:	Ø	Ø.Ø	N/A			
Total:	8	2112.0		<u>Time</u> :	264.0	

ISSUES: DESIGN : MAINTAINABILITY : TIME/ON-LINE : COST/MAMPOWER

Technology Need Description:

Technology Candidates Identified:

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Seq. Task No: 22.000 Facility: OPF OMI Page Count: 163 <u> 3MI No</u>: V6018 OMI Title: CABIN AIR RECIRCLATION INSPECTION AND MAINTENANCE Subtask OMI(s): Prerequisite Task OMI: Hazard: N Level: <u>Vehicle Power Required:</u> N <u>LCC Support Required:</u> N GSE:

Activity Description: TO PERFORM ROUTINE MAINTENANCE ON THE CABIN FAN, IMU, AND AVIONICS BAY 1,2,3 DEBRIS SCREENS. THE CONDENSING HEAT EXCHANGER WILL BE INSPECTED FOR CORROSION AND BIOLOGICAL GROWTH, WATER SAMPLES WILL BE OBTAINED FROM THE CONDENSING HEAT EXCHANGER AND ANALYZED FOR BIOLOGICAL GROWTH. TOTAL SYSTEM WILL BE INSPECTED AND VACUUMED.

<u>Head Count</u>	<u>Man Hours</u>	Remarks		
4	368.0			
Ø	Ø.Ø	N/A		
Ø	0.0	NZA		
Ø	0.0	NZA		
Ø	0.0	N/A		
Ø	Ø.Ø	NZA		
4	368.0		Time:	92.0
	4 Ø Ø Ø Ø	4 368.0 0 0.0 0 0.0 0 0.0 0 0.0 0 0.2	4 368.0 0 0.0 N/A 0 0.0 N/A 0 0.0 N/A 0 0.0 N/A 0 0.0 N/A	4 368.0 0 0.0 N/A 0 0.0 N/A 0 0.0 N/A 0 0.2 N/A 0 0.2 N/A

<u>Issues</u>: ACCESSABILITY : DESIGN :MAINTAINABILITY :

Technology Need Description:

Seq. Task No: 23.000 Facility: OPF OMI Page Sount: 1031
OMI No: V5E02 OMI Title: SPACE SHUTTLE MAIN ENGINE (D) <u>omi No: V5E02</u> COMPONENT REMOVAL/INSTALLATION-HIGH PRESSURE OXIDIZER TURBOPUMP (LPS) Subtask OMI(s): V3512 , V5043 , V3508 , V5057 V9002 , V3553 , , , , , , , , , Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y

OSE: H70-0565 , H70-0774 , H70-0773 , A70-1265 ,

H70-1208 , A70-0885 , H70-0528 ,

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRESSURE OXIDIZER TURBOPUMP (LRU) IN THE OPF (HOR).

Personnel:	<u>Head Count</u>		Remarks		
Mech. Tech:	₹	216.0			
Elec. Tech:	Ø	Ø. Ø			
Quality:	2	72.Ø			
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø. Ø	N/A		
Engineering:	1	72.Ø			
Total:	9	360.Ø		Time:	36.Ø
<u>lssues</u> : ACCESSAP	ILITY :	MAINTAINABILITY	:RELIAE	BILITY	:DESIGN

Technology Need Description:

Technology Candidates Identified:

CRIGINAL PAGE IS OF POOR QUALITY

Seq. Task No: 24.000 CMI No: V5E06 <u>Facility</u>: OPF <u>OMI Page Count</u>: 265 OMI Title: SPACE SHUTTLE MAIN ENGINE LRU COMPONENT REMOVAL/INSTALLATION HIGH PRESSURE FUEL TURBOPUMP

<u>Subtask OMI(s):</u> V3512 , V3553 , V5043 V5057 , V9002 , V9001VL1 , Q3119 , 73508 , 13205

Prerequisite Task OMI:

Hazard: Y Level:

OSE: H70-1208

, H70-0528

, H70-0774

, A70-0501

, S70-0902

, S70-0695-2

, A70-0983

, H70-0565

Activity Description: TO PROVIDE PROCEDURES TO REMOVE SSME HIGH PRUSSURE FUEL TURBOPUMP (LRU) IN THE OPF (HOR).

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	6	215.0			
Elec. Tech:	Ø	Ø.Ø			
<u>Quality:</u>	2	72.0			
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support:</u>	Ø	0.0	NZA		
<u>Engineering</u> :	1	36.Ø			
<u>Total</u> :	9	324.0		Time:	36.0

Issues: ACCESSABILITY :MAINTAINABILITY :RELIABILITY :DESIGN

Technology Need Description:

Seg. Task No: OMI No: V6002		acility: MI Title:	OPF POST FLIGHT	OMI Page Count: 4 INSPECTION LESS TPS	4
Subtask <u>OMI(s)</u> :		9	4	y	5
η		5	7	g	
4		,	9	4	
<u>Prerequisite Task</u> <u>Hazard: Y Level:</u> <u>GSE</u> : A70-0724	<u>: OMI</u> : <u>Ye</u> , A70-1084		<u>er Required</u> : 1 C70-0799	N <u>LCC Support Required</u> , C70-0897 ;	į N
,		,	7		

Activity Description: TO PERFORM VISUAL/NDT INSPECTIONS REQUIRED BY OMRS AND OME AND TO SHAKE DOWN ACCESSIBLE AREAS FOR FLIGHT INDUCED DAMAGE/DEFECTS.

The second of th

Personnel:	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	.3	396.0			
Elec. Tech:	Ø	Ø. Ø	NZA		
<u>Quality:</u>	Ø)	Ø.Ø	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support	Ø	Ø.Ø	N/A		
Engineering	12)	Ø.Ø	NZA		
Total:	3	396.0		Time	137.7
<u> Issues</u> : TECHNOLO	GY :C	OST/MANFOWER	tf II		41 .3

Technology Need Description:

<u>Seq. Task No</u>: 26.000 Facility: OFF OMI Page Count: 132 OMI No: V6003 OMI Title: ORBITER SHAKEDOWN INSPECTION INTERNAL

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

<u>GSE</u>: 970-0902

<u>Vehicle Power Required:</u> N LCC Support Required: N

, *970*-0903

Activity Description: TO PERFORM AN INTERNAL VISUAL AND PHYSICAL INSPECTION OF ORBITER VEHICLE.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	4	96.Ø			
Elec. Tech:	Ø	Ø.Ø	N/A		
<u>Quality</u> :	Ø	Ø.Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support:</u>	Ø	Ø.Ø	N/A		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
<u>Total</u> :	4	96.0		Time:	24.0

<u>Issues</u>: MAINTAINABILITY :DESIGN CRITERIA :REQUIREMENTS

Technology Need Description:

Activity Description: TO PERFORM POST-LANDING AND PRE-FERRY VISUAL SUPVEY/INSPECTION OF ORBITER THERMAL PROTECTION SUBSYSTEM (TPS)

Remarks Head Count <u>Man Hours</u> Personnel: <u>Mach. Tech</u>: \emptyset . \emptyset (2)0.0 Elec. Tech: (2)7 560.0 Quality: 0.0 QLCC Ops: 0.0 (2)Support: 72.0 6 Engineering: Time: 60.0 13 632.Ø Total:

Issues: TECHNOLOGY : COST/MANHOURS

Technology Need Description: A RELIABLE TEST METHOD TO INSPECT THE TILE SYSTEM TO INCLUDE: CRACKS OR WATER IN THE TILE

ADEQUATE BOND LINE AND CONDITION OF FILLER BAR

INSPECTION METHOD SHOULD BE NON-INVASIVE, AUTOMATED, AND CAPABLE OF COMPUTER ANALYSIS.

Technology Candidates Identified:

- * ACCUSTIC EXCITATION/LASER SENSING
- * NASA/ KSC FUNDED STUDY
 - * EG&G/IDAHO NATIONAL ENGINEERING LABORATORY (INEL)
 - * PHASE I COMPLETED NON-CONTACTING ACOUSTO-OPTIC SENSING FEASIBLE
 - * PHASE II WILL REFINE AND QUALIFY SENSOR, PROTOTYPE THE SYSTEM
- * BACKSCATTER X-RAY IMAGERY WILL BE INVESTIGATED UPON RECEIPT OF TIMES.

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Seq. Task No: 28.000 Omi No: V9024VL1-VLA Maintenance	*** ***********************************	OPF THERMAL PROT	<u>OMI Page Co</u> ECTION SYSTEM	
<u>Subtask CMI(s)</u> :	y	'n	9	
1	ý	y	,	
enerequisite Task OMI:	•	à	ŋ	
<u>Hazard:</u> N <u>Level</u> :	<u>Vehicle Powe</u>	<u>r Required</u> : N	<u>LCC Support</u>	Required: N
<u>ese</u> :	1		!	ę

Activity Description: TO PROVIDE GUIDELINES FOR EVALUATION AND REWORK OF THE SYSTEM CONDITIONS. OUTLINES PROCESSING STEPS AND INDICATES REQUIRED INSPECTION BUY-OFF TO SUPPORT PLANNING AND PROCESS CONTROL.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Q	Ø.Ø	N/A		
Elec. Tech:	2 2	Ø.Ø	N/A		
<u>Quality:</u>	Ø	Ø.Ø	N/A		
LCC Cas:	73	Ø. Ø	NZA		
<u>Support:</u>	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	Ø	0.0		Time:	60.0
<u>Issues</u> :	u =		n u		21 .d

Technology Need Description:

<u>Seq. Task No</u> : 29.000 <u>OMI No</u> : V1053	<u>Facility:</u> <u>OMI Title</u> :	OPF ECLSS CABIN	OMI Page Count: 279 SENSOR FUNCTIONAL TEST	
(LPS) <u>Subtask OMI(s)</u> : V3511	, V3512	4	ÿ	9
ņ	7	à	y	,
•	5	5	ħ	
<u>Prerequisite Task OMI:</u> <u>Hazard: N Level:</u> <u>GSE</u> : C70-0748 , C70-1 M70-0022 , S70-0790-9	1173 , ,	<u>er Required</u> : Y A70-0658 034-2 ,	<u>LCC Support Required:</u> , C72-0831 ,	Y

Activity Description: TO PERFORM INSTALLATION, REMOVAL AND CHECKOUT OF COR AND PRO2 SENSORS PLUS A FUNCTIONAL TEST OF THE CABIN PRESSURE SENSOR.

Personnel:	Head Count	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	1	12.0			
Elec. Tech:	4	40.2			
Guality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø. Ø	N/A		
Support	Ø	Ø.Ø	NZA		
	Ø	Ø.Ø	N/A		
Testals	T	52. 0		Time"	
<u>Engineering:</u> <u>Total</u> :			14717	<u>Time</u> :	12.2

Issues: FAULT DETECTION :COST/MANHOURS :

<u>Technology Need Description</u>:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

ORIGINAL PAGE 19 OF POOR QUALITY 11

Seq. Task No: 30.000 Facility: OFF OMI Page Count: 26 OMI No: Y7253 OMI Title: WINDOW POLISHING FOR CONTAMINATION REMOVAL Subtask OMI(s): Prerequisite Task OMI: <u>Hazard</u>: N Level:

<u>Vehicle Power Required:</u> N LCC Support Required: N GSE: A70-0580

<u>Activity Description:</u>TO POLISH ORBITER EXTERNAL WINDOW SURFACE FOR CONTAMINATION REMOVAL.

<u>Personnel:</u>	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	2	120.0			
<u>Elec. Tech:</u>	Ø	Ø.Ø	N/A		
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	N/A		
<u>Support</u> :	Ø	Ø. Ø	NZA		
<u>Engineering:</u>	Ø	Ø.Ø	N/A		
Total:	2	120.0		Time:	60.0

<u>Issues</u>: TECHNOLOGY : MAINTAINABILITY : COST/MANHOURS :

Technology Need Description: POSSIBLE DESIGN SOLUTIONS INCLUDE:

- * DEVELOP A NEW MATERIAL FOR THE WINDSHIELD WTIH SURFACE THAT CONTAMINATION WIL NOT ADHERE TO.
- * PROVIDE AN OVERLAY OR TREATMENT THAT COULD EITHER BE JETTISCHED AFTER ASCENT OR REMOVED AFTER FLIGHT.
- * REDESIGN SRB SEP MOTOR EXHAUST TO PREVENT IT FROM IMPINSING ON THE WINDOWS.

Technology Candidates Identified: FOSSIBLE CANDIDATES:

- * CARBON COATING WITH HARDNESS PROPERTY OF DIAMONDS
- * ION BEAM OR SPUTTERING
- * CHEMICAL VAPOR DEPOSITION
- * APPLICATION R&D
- * SDIO (CRYSTALLINE CARBON TECHNOLOGY INITIATIVE)
- * PENN STATE (CONSORTIUM ON DIAMOND FILM)
- * NASA/LERC
- * POLYGRYSTALLINE MGAL204 SPINEL (FOR HIGH PERFORMANCE WINDOWS)
- * USE MITIMOL TO JETTISON AN OVERLAY

<u>Seq. Task No:</u> 31.000 <u>CMI No</u> : V1022	<u>Facility</u> : OPF <u>OMI Title</u> : FU	EL CELL AND P	<u>OMI Page Count:</u> RSD SYSTEM TEST -	810 (LPS)
<u>Subtask CMI(s)</u> : V3500 V3512 , V3515 V7001VLI , V9014	, V35Ø2 , V3527 , V9Ø16	, V3507 , V5033 ,	, 83511 , VEØ34	
<u>Frerequisite Task OMI</u> : <u>Hazard</u> : N <u>Level</u> : <u>GSE</u> : C70-0807 , C70- S70-0531-1,-2 , S70-0698-	0.743-2 . C70-	·Ø834-1,-2 ,	<u>CC Support Requir</u> C72-1227	ed: V

Activity Description: TO PROVIDE PROCEDURE FOR VERIFICATION OF FUEL CELL/PRED INSTRUMENTATION AND CONTROLS INCLUDING FUNCTIONAL OPERATIONS OF SYSTEM RELIEF VALVES AND CONTROLS CIRCUITS ON ORBITER VEHICLE.

Personnel:	Head Count	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:		144.0			
Elec. Tech:	1	72.0			
Quality	1	72.0			
LCC Opsi	<u>~</u>	144.2			
Support:	€2	Ø.Ø	NZA		
Engineering:	Ø	Ø. 2	NZA		,
Totals	6	432.0		<u>Time</u> :	72.0
45.47					2

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003) SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 57 (V1003) SEE TIS 5 (V1091)

Seg. Task No: 32.000 OMI No: V1026 FUNCTIONAL TEST (LPS)	Facility: OMI Title:	OPF WASTE MANAGEMENT	MI Page Count: SYSTEM LEAK AMD	352
<u>Subtask OMI(s): V3500</u> V9001 , V9014	, V3511	, V3512	, V5267	
, ,	,	7	g 's	
<u>Prereguisite Task OMI</u> : <u>Hazard:</u> N <u>Level:</u> <u>GSE</u> : C70-0907 , C70- M70-0022 , S70-0791-	0743-001 , k	<u>er Required</u> : Y <u>LD</u> 47 0-0561-005 , A 656 , P7 0 -10	70-0658-002	<u>ed</u> . Y

Activity Description: TO PROVIDE PROCEDURES TO INSTALL WASTE COLLECTOR, TO TEST WASTE SUBSYSTEM AND WASTE WATER MANAGEMENT SYSTEM, AND PERFORM WASTE MANAGEMENT SYSTEM TURNAROUND OPERATIONS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	5	320.0	**** **********************************		
Elec. Tech:		192.0			
<u>Quality</u> :	Ø	0.0	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support:</u>	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	2)	0.0	N/A		
Total:	8	512.0		<u>Time</u> :	64.Ø
<u> Issues</u> : TECHNOLO	3Y :T	IME/OFF-LINE	:TIME/O	N-LINE	11 12

Technology Need Description:

<u>Seq. Task No</u> : 33.000 <u>OMI No</u> : V6012	Facility: <u>OMI Title</u> :	OPF HYDRAULIC SYS	OMI Page Count: TEM INSPECTION	lo lo
<u>Subtask OMI(s)</u> : V3511	, V5 0 57	, V5Ø64	, 77002. 28	1
†	9	9	7	1
ÿ	,	9	ij	
<u>Prerequisite Task OMI:</u> <u>Hazard</u> : N <u>Level</u> : <u>GSE</u> : ,	<u>Vehicle Pow</u>	<u>er Required</u> : N	LCC Support Require	<u>d</u> : N

Activity Description: TO INSPECT THE HYDRAULIC SYSTEM PREFLIGHT AND POSTFLIGHT TO DETECT SYSTEM DEGRADATION.

<u>Personnel</u> :	<u> Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	I	204.0			
Elec. Tech:	4	272.0	*		
Quality:		Ø. Ø	N/A		
LCC Ops:	Ø	Ø . Ø	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	N∕A		
Total:	7	476. 0		<u>Time</u> :	60.Ø

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

<u>Facility: OPF OMI Page Count</u>: 904 <u>OMI Title</u>: OPF-VEHICLE HYDRAULIC POWER UF/DOWN Seg. Task No: 34.000 OMI No: V9002.01-.10

, V9ØØ1 Subtask OMI(s): S3500 , V1133

 Frerequisite Task OMI:

 Hazard:
 Y Level:
 Vehicle Fower Required:
 Y LCC Support Required:
 Y CC Support Requir

Activity Description: APPLY HYDRAULIC GROUND POWER TO THE ORBITER TO SUPPORT HYDRAULIC OR ANY ASSOCIATED SUBSYSTEM TESTING.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Toch</u> :	Z.	140.0			
Elec. Tech:	3	72.0			
<u>Quality</u> :	2)	Ø. Ø	N/A		
LCC Ops:	Ø	0.0	NZA		
<u>Support</u> :	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø. Ø	NZA		
Cotal:	6	212.0		Timer	68.0

<u>Issues</u>: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

Facility: OPF OMI Page Count: 96 <u>Seq. Task No</u>: 35.000 OMI Title: CRBITER HYDRAULIC SYSTEM GN2 OMI No: V1131 ACCUMULATOR SERVICING (LPS) ; V9Ø14 , V3511 <u>Subtask OMI(s)</u>: V9001VL1 Prereguisite Task OMI: <u> Vehicle Power Required: Y LCC Support Required: Y</u> Hazard: N <u>Level</u>: <u>GSE: Z70-0018-2-3</u>, C70-0743-007, S70-0646

Activity Description: TO DETERMINE ACCUMULATOR PRECHARGE PRESSURE AND TO PRECHARGE THE ORBITER HYDAULIC SYSTEM BOOTSTRAP ACCUMULATORS AND THE SSME RETURN ACCUMULATOR TO FLIGHT PRESSURES IF SERVICING REQUIRED.

Personn el:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	3	72.0			
Elec. Tech:		48.Ø			
Quality:	Ø	Ø. Ø	N/A		
	2	Ø.Ø	N/A		
<u>Support</u> :	Ø	Ø.0	NZA		
<u>sarrur.</u> Engineer <u>ing</u> :	Ø	Ø.Ø	N/A		
Total:	ror Total	120.0		<u>Time</u> :	24.0
<u>Issues</u> : TECHNOLO	97 :C	OST/MANHOURS	:DESIGN	CRITERIA	n a

Technology Need Description:

<u> Technology Candidates Identified</u>:

<u>Technology Identification Sheet</u>

<u>Saq. Task No</u>: 36.000 Facility: OPF <u>OMI Page Count</u>: OMI No: 49022 OMI Title: ET UMBILICAL DOOR POSITIONING

Subtask OMI(s): V9001VL1

Prerequisite Task OMI:

Hazard: N Level: GSE: A70-0603

<u> Yehicle Fower Required: Y LCC Support Required: Y</u> , A70-1031 ,

Activity Description: PROVIDE PROCEDURES FOR POSITIONING THE ET UMBILICAL DOCKS, DOOR LATCHES AND CENTERLINE LATCHES TO SUPPORT OPERATIONAL AND MANUFACTURING REQUIREMENTS.

<u>Parsonnel:</u>	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	3	324.0	The state of the s		
<u>Elec. Tech</u> :	3	324.Ø			
<u>Guality</u> :	Ø	Ø . Ø	N/A		
<u>.CC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support</u> :	22	Ø. Ø	NZA		
<u>Engineering:</u>	Ø	Ø. Ø	NZA		
<u>Total</u> :	5	548.Ø		Time:	108.0
<u> </u>	HOURS : F	EQUIREMENTS	:DESIGN	CRITERIA	} :

Technology Need Description:

<u>Seg. Task No</u> : 37.000 <u>OMI No</u> : V1123	<u>Facility</u> : OF <u>OMI Title</u> : [PF ECLSS ARS FUNCTI	MI <u>Page Count</u> : : ONAL TEST (LPS)	2 0 9
<u>Subtask OMI(s)</u> : V35Ø1	, V9001VL1	, V3 51 1	, V3512	Ţ
•)	9	7	7
ÿ	7	5	"	
<u>Prerequisite Task OMI:</u> <u>Hazard:</u> N <u>Level:</u> <u>69E</u> : C70-0548-01 , S70-	<u>Vehicle Power</u> Ø679-Ø3 , C70		C Support Requir	<u>ed:</u> Y
	д	5		

Activity Description: TO PERFORM OPERATIONS NECESSARY TO FUNCTIONALLY TEST THE ARS WATER COOLANT LOOPS, CABIN TEMPERATURE CONTROL AND HUMIDITY SEPARATOR SYSTEMS, AND AVIONICS BAYS AND IMU AIR CIRCULATION CONDITIONING SYSTEM.

Personnel:	<u> Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	1	4.12			
Elec. Tech:		12.0			
Quality:	(2)	20.00	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	NZA		
Total:	4	16.0		Time:	4.0

ISSUES: FAULT DETECTION :TIME/ON-LINE :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Seq. Task No: 38.020 GMI No: V1:34 Facility: OPF Orl Page Court: OMI Title: WATER DRAIN AND MAZARDOUS GAS DETECTION LINE VERIFICATION AND DRAIN/VENT FILTER REPLACEMENT Subtask OMI(s): Prerequisite Task OMI:

<u>Hazard: N Level: Yehicle Power Required: N LCC Support Require 38E</u>: 570-0965 , 570-0679 , 570-0772 , Z70-0019-05 , 570-0657 , A70-0702 , S34-0168-01 , <u> Vehicle Power Required: N. LCC Support Gegarmed</u>: N

Activity Description: TO REMOVE RESIDUAL WATER ACCUMULATION FROM ORDITER REDS AND MOSE WHESE DRAIN LINES AND TO VERIFY NO LEAKS IN THE FROS AND NOSE WHISE DRAIN LIMES AND THE HODS SENSOR LINES UNDER VACUUM CONDITIONS.

<u>Porsonnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
<u> Mech. Tech</u> :	4	32.0			
Elec. Tech:	7 2	16.0			
<u>Quality</u> :	(Z)	Ø. Ø	MZA		
<u> 1.000 - 055 55 2</u>	Ø	Ø . Ø	874		
<u>Support</u> :	Ø	Q : Q	MZA		
<u>Engineering:</u>	Ø	2.0	NZΑ		
71° - 44° - 57° - 1 - 12° - 12	45	48.0		Time:	2.0
'ashes: DESIGN	• MA	INTAINARILIT	· Y :		n

<u> Technology Noed Description:</u>

Tochnology Candidates Identified:

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 Seq. Task No:
 39.000
 Facility:
 OPF
 OMI Page Count:
 746

 OMI No:
 V1078
 OMI Title:
 APU LUBE OIL SERVICING-LPS

 Subtask OMI(s):
 \$3500
 \$V9014
 \$V3504
 \$V9021VL)

 Frencquisite Task OMI:
 \$Vehicle Power Required:
 Y LCC Support Required:
 Y CC Support Required:

 Mazard:
 Y Level:
 Vehicle Power Required:
 Y LCC Support Required:

 MSE:
 C70-0743-002
 \$570-0679-11
 \$570-0778-3
 \$570-0679-2

 C70-0700-11A
 \$572-0694-5
 \$570-0613
 \$570-0752

Activity Description: PERFORM POST FLIGHT CONTINGENCY SAMPLING & ULLAGE CHECK, MAGNETIC CHIF INSPECTION, BEARBOX REPRESSURIZATION, OFFLOAD OIL AND PURSE WITH GN2. REMOVE FLIGHT FILTER, INSTALL FLUSH FILTER & FLUSH, REPLACE FLIGHT FILTER AND LEAK TEST. MONITOR DELTA PRESSURES BETWEEN ALL APU GEARBOXES AND RESPECTIVE DRAIN CAVITIES.

Personnel:	Head Count	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	4	192.0			
Elec. Tech:	2	96.Ø			
Quality:	(2)	Ø.Ø	NZA		
LCC Ops:	②	Ø.Ø	N/A		
Support:	$\langle \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \! \!$	0.0	N/A		
Engineering:	(2)	Ø. 2	N/A		
Total:	5	288.0		<u>Time</u> :	48.0

<u>Issues</u>: TECHNOLOGY : REQUIREMENTS : DESIGN CRITERIA :

Technology Need Description:

Technology Candidates Identified:

OF POOR QUALITY

<u>Beg. Tack No: 40,00</u> <u>OMI No</u> : V6005		OPF STAR TRACKSR	OMI Page Count: 168 INSPECTION AND CLEANING	<u></u>
<u>Bubtask OMI(s): V3508</u>	, V3509	, VS511	4	
¥.	7	9	į	
5	y	y	ų.	
Prerequisite Task OMI:				
Hazard: N <u>Level</u> :	<u>Vehicle Power</u>	<u>r Requirad:</u> Y	<u>LCC Support Required:</u>	N.
<u>GSE</u> : A70-0887 ,	A70-1019 , H	700-0789	3	
9	ŋ	ÿ		

Activity Description: TO PROVIDE A PROCEDURE FOR INSPECTION, CLEANING, REMOVAL AND INSTALLATION OF THE STAR TRACKER, PROTECTIVE WINDOW AND LIGHT SHADE.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	1.	8.Ø			
Elec. Tech:	1	8.0			
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	Ø. Ø	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	2	16.0		Times	9.7
<u>Issues</u> : TECHNOLO	3Y :		n a		g 3

Technology Need Description:

<u>Seq. Task No: 41.00</u> <u>OMI No:</u> V1153	00 <u>Facility:</u> 0 <u>OMI Title</u> :	OPF APU WATER SERVI	<u>OMI Pace Count</u> : 175 ICING (LPS)
<u>Subtask OMI(s)</u> : V3500 V7223 , V9014	, S9001 , V2350	, V3511 , V3508	, V3512 , V3502
y	y	7	¥.
<u>Prerequisite Task OMI:</u>			
<u> Hazard:</u> N <u>Level</u> :	<u>Vehicle Power</u>	<u>- Required: Y L</u>	<u>CC Support Required: "</u>
GSE: C70-0743-002 ,	\$70-0679-11 , \$7	7 0-0 986 ,	S70-1232 ,
770-0018-006 ,	5	"	

Activity Description: TO PERFORM THE FOLLOWING OPERATION ON THE PRIMARY AND SECONDARY PUMP/VLV COOLING WATER TANKS AND THE INJECTOR COOLING TANK, GFFLUAD, DIAPHRAGM LEAK TEST AND SERVICING.

the control of the co

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	4	32.0			
Elec. Tech:	3	24.Ø			
Quality:	Ø	Ø. Ø	NZA		
LCC Ops:	2	Ø.Ø	NZA		
Support:	(Z)	0.0	NZA		
<u>Engineering</u> :	Ø	Ø.0	NZA		
Total:	7	56.Ø		Time:	8.2

Issues: TECHNOLOGY : COST/MANHOURS : DESIGN CRITERIA :

Technology Need Description:

<u>Seq. Task No</u> : 42.000 <u>OMI No</u> : V1005	<u>Facility:</u> <u>OMI Title</u> :	OPF ORBITER COMM.	<u>OMI Fage Count</u> : 1899 SYSTEM TEST (LPS)	
<u>Subtask OMI(s)</u> : D2013	, S3500	, V35Ø2	, V3528	,
790017L1 ,	9	ŋ	ŋ	
7	5	5	3	
Prerequisite Task OMI:				
<u> Hazard:</u> Y <u>Level:</u>	<u>Vehicle Fowe</u>	er Required: Y	<u>LCC Support Required:</u>	Y
<u>08E</u> : A70-0886	Ø625 , C	070-0724-1	, C70-0725-1 ,	
C70-0727 ,	,	7		

Activity Description: TO PERFORM A COMPLETE VERIFICATION OF ALL OF THE ORBITER COMMUNICATION SYSTEMS.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	Ø.Ø	NZA		
Elec. Tech:	3	24.0			
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	Ø . Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	0.0	N/A		
<u>Total</u> :	3	24.0		Time:	0.0
<u>Issues</u> : FAULT DE	TECTION :				n s

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Activity Description: TO VERIFY FUNCTIONAL PATHS OF THE AIR DATA SYSTEM INCLUDING PROBE HEAT/DEPLOY SWITCH, DISCRETES, ANALOGS, AND TO MEASURE THE ACCURACY OF THE AIR DATA PRESSURE TRANSDUCER ASSEMBLIES.

Personnel:	Head Count	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	3	24.0			
Elec. Tech:	dies	16.0			
Quality:	Ø	Ø. Ø	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	0.0	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	5	40.0		<u>Time</u> :	8.0

Issues: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

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SEE TIS 57 (V1003)

the control of the co

<u>Seq. Task No</u> : 4 <u>OMI No</u> : V1076	4.000 Facili OMI Ti		OMI Page Count: OS FUNCTIONAL TEST	324
<u>Subtask OMI(s)</u> :	5	y	4	· .
¥	,	•	,	· · · · · · · · · · · · · · · · · · ·
Commence and an extension of the commence of t	on harm	,	ş	
<u> Prerequisite Task</u>	11/11 1			
<u> Mazard:</u> N <u>Level</u> :	<u>Vehicle</u>	Power Required:	N LCC Support Requ	tired: N
<u>99E</u> : 570-0532	, A7Ø-Ø958	, 970-0989	, \$70-0990-XXX	1
4	•	•		

Activity Description: TO PROVIDE PROCEDURES TO VERIFY THE FUNCTIONAL CORRECTNESS OF THE GRBITER WINDOW CAVITY CONDITIONING SYSTEM.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	3	288.0			
Elec. Tech:	2	192.0			
<u>Quality:</u>	Ø	Ø. Ø	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support</u> :	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
<u>Total</u> :	5	480.0		<u>Time</u> :	95.0
<u>Issues</u> : TECHNOLO	3Y : C	DST/MANHOURS	:TIME/C	YCLE	<u>.</u>

Technology Need Description:

POSSIBLE ALTERNATIVES INCLUDE:

- 1. A NEW DESICCANT WITH RELIABLE INDICATORS FOR VISUAL INSPECTION.
- 2. IMPROVE ACCESSABILITY OF THE DESICCANT ASSEMBLIES.
- 3. A NEW METHOD TO CONTROL THE MOISTURE INGESTED OR TRAPPED IN THE CAVITIES BETWEEN THE WINDOW PANES.

<u>Technology Candidates Identified: TECHNOLOGY SEARCH RESULTS:</u>

- 1. NO DESICCANT HAS BEEN IDENTIFIED WITH THE DESIRED PROPERTIES.
- 2. DESICCANT ASSEMBLIES COULD BE RELOCATED TO THE PAYLOAD PAY.
- 3. BUILT-IN DRY PURGED FOR USE DURING THE ASCENT AND DESCENT PORTION OF THE FLISHT.

<u>Seq. Task No</u> : 45.00	<pre>B Facility:</pre>	OPF	OMI Fage Co	4,4,4,0,0,0
<u>omi No</u> : V10 0 8	OMI Title:	ORBITER NAVA:	IDS SYSTEM TES	ST (LPS)
error at the control of the error of the Art.			•	
<u>Subtask OMI(s)</u> :	9	ņ	7	₹
5	ÿ	9	ÿ	9
•	9	7	7	
<u>Prerequisite Task OMI</u> :				
<u> Hazard:</u> Y <u>Level</u> :	<u> Vehicle Pow</u>	<u>er Required</u> : Y	LCC Support	Required: Y
<u>1998</u>	y		7	7

Activity Description: VERIFY NO EXCESSIVE AIR LEAKS IN THE WAVE GUIDE RUN BETWEEN MIDDECK AND ANTENNAS. VERIFY ALL TACANS PASS ACTIVATION AND SELF-TEST REQUIREMENTS AND SYSTEM FUNCTIONS WITHIN ACCEPTABLE LIMITS.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	1	8.0			
Elec. Tech:	Taries 1	24.Ø			
<u>Quality</u> :	Ø	Ø. Ø	N/A		
LCC Ops:	Ø	Ø. Ø	NZA		
<u>Support:</u>	Ø	Ø.Ø	N/A		
Engineering:	Ø)	(). ()	N/A		
Total:	4	32.0		Time:	8.0

<u>Issues</u>: FAULT DETECTION :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

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<u>Seq. Task No:</u> 46. 000 <u>OMI No</u> : V1 0 98		PF LANDING GEAR	OMI Page Cou FUNCTIONAL TES	
Bubtask OMI(s): 83500	, V9001VL1	, V9ØØ2	9	
j	9	9	ņ	
3	,	ÿ	' "	
Prerequisite Task OMI:	Vehicle Power	- Doggirad: V	LCC Support F	Panuirad: V
Hazard: Y Level:		<u> </u>	. C70-0894	A CONTROL OF THE REAL PROPERTY OF THE PARTY
6SE: A70-0601 , A70-0 870-0646 , Z70-0018-0	, , , , , ,	v — e1 7 e2	\$ C57 X01 X0 C0 7 14	ÿ

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Activity Description: TO PROVIDE PROCEDURES FOR VERIFICATION OF PROPER OPERATION OF THE ORBITER LANDING GEAR/DOOR SYSTEM.

<u>Personnel</u> :	<u>lead Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech:</u>	7	56.0			
Elec. Tech:	3	24.0			
Quality:	Ø	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	2	Ø. Ø	N/A		
Engineering:	Ø	Ø.Ø	N/A		
Total:	10	8Ø.Ø		Time:	8.0

1ssues: FAULT DETECTION :TIME/ON-LINE :COST/MANHOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

<u>Seg. Task No</u> : 47.000 <u>Omi No</u> : V1018.0204 DESERVICING (LPS)	Facility: OMI Title	OFF : APU/HYDRAULIC	GMI Page Count: 316 WATER SPRAY BOILER	
Subtask OMI(s):	9	3	7	1
y	7	9	9	:
#	9	y	ÿ	
<u>Frerequisite Task OMI:</u> <u>Hazard: N Level:</u> <u>GSE</u> : S70-0775-2 , S70-0 A70-0792-3 , A70-0790-2	790-1,	<u>wer Required</u> : Y 870-1231 1232 ,	<u>LCC Support Required:</u> , Z70-0018-5 ,	Y

Activity Description: TO SERVICE ORBITER SPRAY BOILERS WITH WATER AND GASEOUS MITROGEN.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	3	24.0			
Elec. Tech:	<u> </u>	24.0			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø)	Ø. Ø	NZA		
Engineering:	Ø	(2) (2)	NZA		
Total:	ద	48.0		Time:	8.2
<u>lssues</u> : TECHNOLO	GY :DI	ESIGN CRITERIA	:REQUIR	EMENTS	n E

<u>Technology Need Description:</u>

Technology Candidates Identified:

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<u> 909. Task No</u> : 48.000	Facility:	OPF	OMI Page Count:	361
<u>omi No</u> : Vi055	OMI Title:	POTABLE WATER	SERVICING - WET	
KSC LANDING (LPS)				
<u>Subtask OMI(s)</u> : S9001VL1	, V35 0 2	, V35Ø4	, V9 0 01VL:	i.
V9 Ø 14 ,	4	ų	,	ģ
5	g	y	7	
<u>Prerequisite Task OMI:</u>				
<u> Hazard:</u> Y <u>Level</u> :	<u>Vehicle Powe</u>	<u>er Required:</u> Y	LCC Support Requi	ired: Y
<u> </u>	153 , 9	570-0742	. 370-0787-2	*
S70 -0 974 ,	7	"		f.

Activity Description: TO SERVICE THE POTABLE WATER SYSTEM WITH 3-5 PPM ICDINE/ WATER FOR FLIGHT CREW CONSUMPTION AND FLASH EVAPORATOR USE.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	5	120.0			
Elec. <u>Tech</u> :	2	48.0			
<u>Quality</u> :	Ø	\varnothing . \varnothing	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support</u> :	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
Total a	7	168.0		Limer	24.2
<u>lssues</u> : DESIGN	: RE	EQUIREMENTS	: TECHNO	LOGY	:INTERFACE

Technology Need Description:

Tachnology Candidates Identified:

ORIGINAL PAGE IS OF POOR QUALITY

Facility: OPF OMI Page Count: 590 <u>Seq. Task No</u>: 49.000 OMI Title: KU-BAND COMM/RADAR SYSTEMS TEST (LPS) OMI No: V1178 , V35Ø8 , V1184 <u>Subtask OMI(s)</u>: 83500 , V1114 , V9001VL1 , V9001VL2

, V5006.01 V3528 , V3546 9

Prerequisite Task OMI:
Hazard: Y Level:
OSE: C70-0625, C70-0725, C70-0727, C70-0727-8, C70-0727-8

70-1188 ,

Activity Description: TO VERIFY THAT THE ORBITER KU-BAND COMMUNICATIONS/RADAR SYSTEM OPERATES WITHIN SPECIFIED LIMITS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	2	16.Ø			
Elec. Tech:	5	40.0			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	0.0	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total	7	56.Ø		<u>Time</u> :	8.0

Issues: FAULT DETECTION :COST/MNHOURS :TIME/ON-LINE :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

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<u>Seg. Task No: 50.000</u> <u>OMI No:</u> V1077	Facility: ' OMI Title:	OPF ORBITER FUEL	OMI <u>Page Count</u> : 12: CELL COOLANT SERVICIN	
AND SAMPLING (LPS) <u>Subtask OMI(s)</u> : V2 0 51	, V3511	, V9Ø14	, V9016	:
9	7	ÿ	9	9
Succession to Table OMI.	y	7	9	
<u> Prerequisite Task OMI:</u>				
<u>-lazard:</u> N <u>Level</u> :		<u>r Required:</u> Y	LCC Support Required	a Y
65E: Z70-0019-6 , A70	Ø-Ø685-1 ,		7	
	2	9		

Activity Description: TO PROVIDE PROCEDURES TO MEASURE COMPRESSIBILITY AND SAMPLE THE FUEL CELL COOLANT LOOPS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	3	24.0			
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	\mathcal{Q}	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
<u>Support:</u>	Ø	0.0	N/A		
Engineering:	Ø	0.0	NZA		
Totals	S	24.2		Time:	0,2
<u>Issues</u> : TECHNOLO	BY :		71 21		2

Technology Need Description:

SEE TIS 5 (71091)

Technology Candidates Identified:

SEE TIS 5 (V1091)

Seg. Task No: 51.000	<u>Facility</u> : OPF	OM	<u> I Page Count:</u> 2	216
OMI No: Vi093	<u>OMI Title</u> : FUE	L CELL SINGLE	DELL VOLTAGE TES	3 T
(LPS)				
Subtask OMI(s): S3500	, V1Ø5Ø	, V1Ø91	, V1120	9
V35 0 2 , V35 0 7	, V3511	, V3512	, V2515	9
V9001 , V9014	, V9Ø16	9	5	
Prerequisite Task OMI:				
<u> Hazard: Y Level</u> :	<u>Vehicle Power Re</u>	······································	<u> Support Require</u>	eda Y
<u>GSE:</u> C70-0807 , C70-0	· · · · · · · · · · · · · · · · · · ·	,	Ø-Ø679-1 ,	
870-0695-1 , 870-0698-1	.,2,3 , 87Ø-Ø815-2	2,3 , S70-082	5-1,2	

Activity Description: TO PROVIDE PROCEDURES TO CONDUCT A SINGLE CELL VOLTAGE TEST (BOTH THE TAFEL TEST AND GN2 DIAGNOSTIC TEST) OF THE ORBITER FUEL CELLS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	3	Ø.Ø	NZA		
Elec. Tech:	2	0.0	NZA		
Quality:	2	Ø.Ø	NZA		
LCC Ops:	2	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	Ω . Ω	NZA		
Total:	o	Ø.Ø		<u>Time</u> :	2.2
<u>Issues</u> : TECHNOLO	GY :TI	ME/ON-LINE	u s		n a

Technology Need Description:

SEE TIS 5 (V1091)

Technology Candidates Identified:

SEE TIS 5 (V1091)

والمحارب والمرابط والمراب والمرابع والمرابع والمرابع والمرابع والمرابع والمرابع والمرابع والمرابع والمحارب والم

 Seq. Task No:
 52.000
 Facility:
 OPF
 CMI Page Count:
 336

 CMI No:
 V1097
 OMI Title:
 ORBITER/ET UMBILICAL CLOSEOUT DOOR

 FUNCTIONAL TEST (LPS)
 Subtask OMI(s):
 \$3500
 , V3502
 , V9001VL1
 ,

 Subtask OMI(s):
 \$3500
 , V3502
 , V9001VL1
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Activity Description: TO PROVIDE PROCEDURES FOR VERIFICATION OF PROPER OPERATION OF THE ORBITER/ET UMBILICAL CLOSEOUT DOORS AND LATCHES POWER DRIVE UNITS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	3	24.0			
Elec. Tech:	3	24.0			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	0.0	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	(Z)	Ø.Ø	NZA		
Total:	6	48.0		Time:	8.0
<u>Issues</u> : DESIGN	: T	IME/ON-LINE	:COST/M	ANHOURS	24 16

Technology Need Description:

 Seq. Task No:
 53.000
 Facility:
 OPF
 OMI Page Count:
 381

 OMI No:
 V5069
 OMI Title:
 ORBITER JACK TRANSFER TO AND FROM

 H70-0570 BODY JACKS & A70-0999 LANDING GEAR SUPPORT STANDS
 Subtask OMI(s):
 V5103
 V3508
 V3508

Activity Description: TO TRANSFER ORBITER TO BODY JACKS OR L.G. SUPPORT STANDS AS REQUIRED TO SUPPORT OTHER SCHEDULED OPERATIONS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	16	128.Ø			
Elec. Tech:	Ø	Ø . Ø	N/A		
Quality:	Ø	0.0	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	(2)	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	N/A		
Total:	16	128.0		<u>Time</u> :	8.2
e comment AMANA	umilio .		2		27 11

<u>Issues</u>: COST/MANHOURS :

Z70-0018 ,

Technology Need Description:

Seq. Task No: 54.000 OMI No: V1196 OPERATIONS (LPS)	Facility: OMI Title		<u>OMI Page Count:</u> HT FUEL SYSTEM	509
<u>Subtask OMI(s)</u> :	5	ÿ	9	9
ŋ	*	,	9	9
Prerequisite Task OMI:	,	,	7	
<u>Hazard:</u> Y <u>Level:</u> <u>GSE:</u> C70-0743-002 , C70- S70-0679-11 , S70-0757	0743-004 ,	<u>Dwer Required</u> : Y , F70-0013-006 -0758 ,	<u>LCC Support Requi</u> , S70-0679-02	tred: Y '

Activity Description: TO VENT APU FUEL TANKS AND FUEL MANIFOLDS TO PAD PRESSURE. DRAIN APU CAVITY DRAIN SYSTEM CATCH BOTTLES, AND PERFORM FUNCTIONAL TEST OF CATCH BOTTLE RELIEF VALVES AND ALCOHOL-FLUSH CAVITY DRAIN SYSTEM.

<u>personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	5	120.0			
<u>Elec. Tech</u> :	2	48.0			
<u>Quality:</u>	Ø	Ø . Ø	N/A		
<u>LCC Ops</u> :	Ø	Ø. Ø	NZA		
<u>Support:</u>	Ø	ଉ.ଉ	N/A		
<u>Enginmering:</u>	Ø	Ø. Ø	N/A		
Total:	7	168.0		<u>Time</u> :	24.0
<u>Issues:</u> TECHNOLO	GY :C	OST/MANHOURS	:DESIGN		.

Technology Need Description:

Facility: OFF OMI Page Count: 558 <u>Seq. Task No</u>: 55.000 OMI Title: MASTER EVENT CONTROLLER/PYROTECHNIC OMI No: V1086

INITIATOR CONTROLLER VERIFICATION (LPS)

, V9001 , V35Ø7 Subtask OMI(s): V1003 <u>935</u>00 , 4

Prerequisite Task OMI:

<u> Vehicle Power Required: Y LCC Support Required: Y</u> Hazard: N <u>Level</u>: , C72-11<mark>28 , E70-0011 , C72-1280-1 ,</mark> GSE: C77-0202 C72-1127-2 ,

Activity Description: TO FUNCTIONALLY VERIFY OPERATIONS OF EACH MASTER EVENT CONTROLLER. TEST AND VALIDATE ALL ORBITER MEC/FIC FUNCTIONS AND VALIDATE ALL ORBITER, ET, SRB, AND GROUND INTERFACES. VARIFY MANUAL PIC/LCA FUNCTIONS, FIRE EXTINGUISHERS AND LANDING GEARS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	2	48.Ø			
Elec. Tech:	3	72.0			
Quality:	Ø	Ø.Ø	NZΑ		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	N/A		
Total:	5	120.0		<u>Time</u> :	24.0

Issues: FAULT DETECTION : COST/MANHOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

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Seq. Task No: 56.000

Seq. Task No: 56.0000

Seq. Task No: 56.0000

Seq. Task No: 56.0000

Seq. Task No: 56.0000

Seq. Task No: 56.0

Activity Description: TO PERFORM NORMAL MAINTENANCE AND INSPECTION OF MAIN AND NOSE LANDING GEAR.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	4	288. Ø			
<u>Elec. Tech</u> :	②	Ø.Ø	N/A		
<u>Quality</u> :	Ø	0.0	N/A		
<u>LCC Ops</u> :	Ø	0.0	N/A		
<u>Support</u> :	Ø	0.0	NZA		
Engineering:	Ø	Ø.Ø	NZA		
<u>Total</u> :	4	288.Ø		<u>Time</u> :	72.0
<u>Issues</u> : DESIGN	a F	EQUIREMENTS	: TECHNO	LOGY	:: a

Technology Need Description:

<u>Seq. Task No</u> : 57.000	<u>Facility:</u>	OPF	OMI <u>Page Count</u> : 120
<u>OMI No</u> : V1003	<u>OMI Title</u> :	ORBITER POWER	SYSTEM VALIDATION
<u>Subtask OMI(s)</u> : 83500	, V1Ø84	, V35 0 7	, V3511
V9001 ,		,	,
<u>Prerequisite Task OMI:</u> <u>Hazard:</u> N <u>Level:</u> <u>GSE:</u> C70-0807 , C72- C70-0898 , C70-0519		C72-1079	<u>LCC Support Required</u> : ` , S70-0508- 2

Activity Description: TO FUNCTIONALLY EXERCISE AND VERIFY THE ELECTRICAL POWER DISTRIBUTION AND CONTROL SYSTEM AND ITS INTERFACES.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	2	24.0			
Elec. Tech:	4	48.Ø			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	(2)	Ø . Ø	N/A		
Support:	Ø	Ø.Ø	N/A		
Engineering:	(2)	Ø . Ø	NZA		
Totals	6	72.Ø		Time:	12.0
T EAT TO	TECTION DE	STAN	15 12		n H

Issues: FAULT DETECTION : DESIGN :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Activity Description: TO REMOVE SAFED APS PODS FROM ORBITER FOR TRANSPORT TO HYPER CHECKOUT FACILITIY AND INSTALLATION OF PODS AFTER CHECKOUT.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	Ø.Ø	NZA		
Elec. Tech:	Ø	Ø. Ø	N/A		
Quality:	Ø	Ø.Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø. Ø	N/A		
<u>Support</u> :	Ø	Ø.Ø	NZA		
<u>Engineering:</u>	Ø	Ø. Ø	N/A		
<u>Total</u> :	Ø	Ø. Ø		Timer	7.0
Issues:	:		1		ü

Technology Need Description:

Technology Candidates Identified:

;•;

Activity Description: OBTAIN VACUUM READINGS ON THE MPS VACUUM-JACKETED PROPELLANT LINES PER ML0510-0030

Personnel:	Head Count	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.0	N/A		
Support:	<u>~</u> Ø)	Ø.Ø	N/A		
Engineering:	Ø	0.0	N/A		
Tetale	Ø	Ø. Ø		<u>Time:</u>	8.2
5 Year have broke olds. M					
					2 24

Issues:

Technology Need Description:

Technology Candidates Identified:

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Seq. Task No: 60.000

CMI No: N/A

Subtask OMI(s):

Prerequisite Task OMI:
Hazard: N Level:
GSE:

CMI No: OPF
OMI Page Count: 0

OMI Title: TFS WATERPROOFING

OMI Page Count: 0

OMI Pa

Activity Description: APPLY WATERPROOFING TO THE TPS TILE.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	0.0	N/A		
<u>Elec. Tech</u> :	Ø	Ø.Ø	N/A		
Quality:	23	Ø.Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support</u> :	Ø	Ø. Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	Ø	Ø.Ø		Time:	108.2
<u>Issues</u> : TECHNOLOG	3Y :CO	ST/MANHOURS	:		a u

Technology Need Description:

<u>Seg. Task No</u> : 61.000 <u>OMI No</u> : V1180	Facility: OMI Title:		<u>MI Page Count</u> : 121 [,] PS POD FUNCTIONAL	4
CHECKOUT (LPS) Subtask OMI(s): I2003 M2063 , M3095	, 12022 , M3076	, 13053 , M3141	, M2061 , 03415	+ 7
V2119 , W3103	7	7	ÿ	
Prerequisite Task CMI: Hazard: Y <u>Level</u> : GSE: C72-1227 , S70-0 C70-0886-1 , S70-0784		70-1119-X , C	<u>C Support Required</u> :70-0743 , ;48	2 Y

Activity Description: TO DEMONSTRATE APS OMS/RCS GHE REGULATOR, CHECK VALVE AND RELIEF VALVE/BURST DISC FUNCTIONAL OPERATION AFTER EXEMDED NON-TEST PERIODS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	7	504.0			
Elec. Tech:	3	216.0			
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	0.0	N/A		
Total:	10	720.0		Ti.me:	72. Ø
					:1
<u>Issues</u> :	:		•		*

Technology Need Description:

Technology Candidates Identified:

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<u>Technology Identification Sheet</u>

Seq. Task No: 62.000 <u>Facility</u>: OPF <u>OMI Page Count:</u> 124 OMI No: V1048 OMI Title: NOSE WHEEL STEERING CONTROL BOX CHECKOUT (LPS) Subtask OMI(s): V3500 , V9001VL2 , V9001VL3 , V9002.01 Prerequisite Task OMI: Hazard: Y Level: <u>Vehicle Power Required: Y LCC Support Required: Y </u> GGE: C70-0769

9

Activity Description: TO VERIFY LOGIC ASSOCIATED WITH NOSE WHEEL STEERING AND RESPONSE TO MANUAL AND GPC COMMANDS, VERIFY NO RESPONSE IN CASTER (OFF) MODE AND FAIL LIGHT CYCLES PROPERLY.

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	5	20.0			
Elec. Tech:	3	12.0			
<u>Quality:</u>	Ø	0.0	N/A		
LCC Ops:	Ø	Ø.Ø	NZA		
<u>Support:</u>	Ø	0.0	N/A		
Engineering:	Ø	0.0	N/A		
<u>Total</u> :	8	32.0		Time:	4.0

Issues: FAULT DETECTION :TIME/ON-LINE :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Seq. Task No: 63.000 Facility: OPF OMI Page Count: 310
OMI No: V1065 OMI Title: BRAKE/ANTI-SKID CONTROL SYSTEM TEST

(LFS)

<u>Subtask OMI(s)</u>: V3500 , V9001VL1 , V9001VL3 , V9002.01

9 7 5 7

<u>Prerequisite Task OMI:</u>

<u>Hazard: Y Level: Vehicle Fower Required: Y LCC Support Required: Y</u>

<u>GSE</u>: A70-0771 , A70-0787 , ,

Activity Description: TO VERIFY THE SIGNALS, INTERFACES AND VOTING LOGIC OF THE BRAKE AND SKID CONTROL SYSTEM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	4	16.0			
Elec. Tech:	3	12.0			
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	NZA		
Total:	7	28. Ø		Time:	4.2

Issues: FAULT DETECTION : COST/MANPOWER : MAINTAINABILITY :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

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Activity Description: TO FUNCTIONALLY CHECK THE PROPER OPERATION AND ACCURACY OF THE ORBITER'S AEROSURFACE FLIGHT CONTROL SYSTEMS.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	7	28.Ø			
Elec. Tech:	3	12.0			
Quality:	Ø	0.0	N/A		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø. Ø	N/A		
Total:	10	4Ø.Ø		Times	4.0

Issues: FAULT DETECTION :DESIGN :

Technology Need Description:

<u>99E</u>: C70-0541

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

, M70-0021 ,

OMI Page Count: 489 <u>Facility</u>: OPF 45.00**0** Scq. Task No: OMI Title: FLIGHT CONTROL MFS TVC CHECKOUT AND OMI No: VIØ63 SRB SIMULATED INTERFACE VERIFICATION (LPS) , vseos , V1123 , V9001VL1 , S9001 Subta<u>sk OMI(s)</u>: 53500 , VEØS7 , 79032 V35**0**3 , V35**0**4 Prerequisite Task OMI: <u>Vehicle Power Required: Y LCC Support Required: Y</u> Hazard: Y <u>Level</u>:

Activity Description: TO VERIFY THE COMMAND, FEEDBACK AND FAILURE DETECTION AND FUNCTIONAL OPERATION OF THE ORBITER ASCENT THRUST VECTOR CONTROL.

The state of the s

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		'
Mech. Tech:	4	16.Ø			
Elec. Tech:	3	12.0			
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	(Z)	Ø . Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineeringt	Ø	Ø.Ø	N/A		
Total:	Ž	28. 0		Time:	4.2

Issues: FAULT DETECTION :MAINTAINABILITY :COST/MANHOURS :

Technology Need Description:

<u>GSE</u>: C70-0796

 Deg. Task No:
 66.000
 Facility:
 OPF
 OMI Page Count:
 436

 QMI No:
 V1161
 QMI Title:
 ORBITER VEHICLE BUS REDUNDANCY TEST

 (LPS)
 Subtask OMI(s):
 V9001VL1
 , V9001VL2
 , V9001VL4
 , V1123

 S3500
 , V1171
 ,
 ,
 ,
 ,

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y - GSE: , , , , , ,

Activity Description: TO PROVIDE AN INTEGRATED BUS REDUNDANCY TEST WHICH INCLUDES ALL ORBITER VEHICLE SYSTEMS CONTAINING BUS REDUNDANT DESIGN.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mach. Tach</u> :	1	ខ.ወ			
Elec. Tech:	3	24.0			
<u>Quality</u> :	Ø	Ø. Ø	NZA		
<u>LCC Ops</u> :	Ø	0.0	NZA		
<u>Support:</u>	Ø	Ø.Ø	N/A		
<u>Engineering:</u>	Ø	Ø . Ø	N/A		
Total a	4	32.Ø		Time:	:: , Ø

<u>Issues</u>: FAULT DETECTION :TIME/ON-LINE :COST/MANHOURS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

<u>Seq. Task No</u> : 67.000 <u>OMI No</u> : V1001 VERIFICATION (LPS)	Facility: OMI Title:	OPF SSME ELECTRI	<u>CMI Page Cou</u> CAL INTERFACE	<u>nt</u> : 45
<u> Subtask GMI(s):</u> V9001VL4	ù	7	7	
Í	y	ŋ	9	1
ņ	5	*	ÿ	
<u>Prerequisite Task OMI:</u> <u>Hazard:</u> N <u>Level</u> : <u>OSE</u> : ,	<u>Yehicle Pow</u>	<u>er Required:</u> Y	LCC Support R	<u>equired:</u> Y

Activity Description: PROVIDE STANDARD INSTRUCTION TO TEST ALL SIU AND SSME CONTROLLER COPPER PATHS AFTER ENGINE INSTALLATION, AFTER ELECTRICAL LRU REPLACEMENT AND AFTER ENGINE HOT FIRING.

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	<u>Remarks</u>		
<u>Mech. Tech</u> :	.1	4.0			
Elec. Tech:	3	12.0			
Quality:	Ø	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	NZA		
Total:	4.	16.0		<u>Time</u> :	4.0
Issues:	u. 11		:		n •

Technology Need Description:

Seq. Task No: 68.000	Facility:	OPF	<u>OMI Page Count</u> : 3	524
OMI No: V1041	OMI Title:	ECLSS NITROGEN	I AND OXYGEN SERVICI	ING
AND DESERVICING (LPS)				
<u>Subtask OMI(s)</u> : V9001	, 79014	, S35 00	ý	¥
7	9	9	7	2
9	9	7	y	
<u>Prerequisite Task CMI:</u>				
<u>Hazard:</u> Y <u>Level</u> :	<u>Vehicle Powe</u>	<u>er Required:</u> Y	LCC Support Require	<u>id</u> : Y
<u>GSE</u> : 970-0691-1 , 970	Z- Ø691-2 , S	670-0825-1 ,	8 70-08 25-2 ,	
870-0825-3 , 87 0-08 33	2-6,	7		

Activity Description: TO SERVICE AND DE-SERVICE THE ECLSS GN2 AND GO2 SYSTEMS TO DESIRED PRESSURE.

<u> Cersonnel</u> :	<u>Head Count</u>	<u> Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	3	36.0			
Elec. Tech:	3	36.0			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø. Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	Ø	Ø.Ø	N/A		
Total:	6	72.0		Time:	1.72 . 20
			and the first of the control of		and the second s

<u>Issues:</u> DESIGN CRITERIA : REQUIREMENTS : TIME/ON-LINE : COST/MANHOURS

Technology Need Description:

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Technology Identification Sheet

<u>3eg: Task No:</u> 69.200 <u>3mi No</u> : V5050	Facility: OMI Title:	OPF CREW EQUIPMENT	Carry 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	393
<u> Bubtask OMI(s)</u> : V5010	, V5Ø67	, V5Ø97	ų	Ę
7	7	7	ņ	
7	,	9	à	
<u>Prerequisite Task OMI:</u> <u>Hazard: N Level:</u> <u>GSE</u> : A70-0519 , A70-0 A70-0788 , A70-0883		A70-0668 ,	<u>LCC Support Requir</u> A70-0719	<u>red:</u> N

Activity Description: PERFORM THE MECHANICAL INTERFACE CHECKS OF FEC, INCLUDING COTV, COAS AND FLIGHT BINOCULARS, IN ON-ORBIT CONFIGURATIONS. PRIMARY FUNCTION INCLUDES: FIT CHECK OF FCE (ESPECIALLY THAT WHICH IS NEW TO A PARTICULAR MISSION) AND/OR OSE LIGHTING.

((a,b), (b,b), (a,b), (a,b), (b,b), (a,b), (b,b), (a,b), (a,b),

Personneli	<u> Head Count</u>	Man Hours	<u>Remarks</u>		
Mech. Tech:	(2)	Ø.Ø	NZA		
Elec. Tech:	4	96.Ø			
Quality:	(2)	Ø.Ø	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support	(2)	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	NVA		
Total:	4	96. 0		<u>Time</u> :	24.0
<u>Issues</u> : DESIGN	: CC	ST/MANHOURS	:		# #

Technology Need Description:

<u>Seq. Task No</u> : 70.000 <u>OMI No</u> : V1201	Facility: (OMI Title:	OPF MPS/SSME HELIUM	OMI Page Count: SIGNATURE TEST	m mum
<u>Subtask OMI(s)</u> : V1111	, V1171	, V3535	7	÷
•	9	y.	ÿ	:
, Prerequisite Task OMI:	y	7	y	
Hazard: N Level:	Vehicle Power	r_Required: Y L	CC Support Requi	im months 17
GSE: A70-0702 , S70-			570-0695-8	r totul a
770-0023	y	,		

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS USING VARIAN MASS SPECTROMETER AND PURGE AIR FLOW IN AFT SECTION.

<u>Fersonnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	4	192.0			
Elec. Tech:	3	144.0			
Quality:	Ø	0.0	NZA		
LCC Cps:	Ø	Ø . Ø	N/A		
<u>Support:</u>	Ø	0.0	NZA		
<u>Engineering:</u>	Ø	Ø . Ø	NZA		
<u>Tatal</u> :	7	336.0		<u>Time</u> :	48.0
Issues:	7		:		ri d

Technology Need Description:

Activity Description: PREPARE ORBITER FOR WEIGHT AND BALANCE AND MOVE TO VAS.

<u>Personnel</u> :	Head Coun	·	<u>Remarks</u>	
Mech. <u>Tech</u> :	100	1440.0		
Elec. Tech:	6	864.0	-	
Quality:	Ø	Ø.Ø	N/A	
LCC Cost	Ø	Ø.Ø	NZA	
Support:	Ø	0.0	N/A	
Engineering:	Ø	Ø.Ø	NZA	
Tatal	16	2304.0	<u>Time</u> :	144.0
<u>Issues</u> : COST/MAN	HOURS :	REQUIREMENTS	:TIME/ON-LINE	: QA

Technology Need Description:

Seq. Task No: 72.000

OMI No: V1176

Subtask OMI(s): V3508

Prerequisite Task OMI:

Hazard: N Level:

Yehicle Power Required: N LCC Support Required: N SOE:

Yehicle Power Required: N LCC Support Required: N Task OMI:

Yehicle Power Required: N LCC Support Required: N Task OMI:

Yehicle Power Required: N LCC Support Required: N Task OMI:

Yehicle Power Required: N LCC Support Required: N Task OMI:

and the second of the second o

ACCESSIBLE PAYLOAD BAY SURFACES TO OME OF THREE CLEANLINESS LEVEL OPTIONS AND TO QUALITATIVELY ASSESS THE TYPES AND LEVELS OF YARIOUS CONTAMINANTS WITH THE INTENT OF IMPROVING CONTAMINATION CONTROLS.

<u>Parsonnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	4	144.0			
<u>Elec. Tech</u> :	Ø	Ø. Ø	NZA		
<u> </u>	Ø	0.0	NZA		
LCC Ops:	Ø	0.0	NZA		
<u>Support:</u>	Ø	Ø.Ø	N/A		
<u>Engineering</u> :	2	Ø. Ø	NZA		
<u>Total</u> :	<i>4</i> }	144.2		Time:	36.0

<u>Issues</u>: COST/MANHOURS :REQUIREMENTS :DESIGN :TIME/ON-LINE

Technology Need Description:

<u>Seg. Task No:</u> 73.000 <u>OMI No:</u> V1059	Facility: (OMI Title:	OPF DPS COMPUTER	OMI Page Count: 18 COMPLEX CHECKOUT (LPS)	
<u>Subtask OMI(s)</u> : 5 35 00	, S9ØØ1	, V9 00 1V	L1 ,	7
₱	7	3	?	÷
7	ÿ	y	¥	
<u>Prerequisita Task OMI:</u> <u>Hazard</u> : N <u>Level</u> :	<u>Vehicle Powe</u>	- <u>Required</u> : Y	LCC Support Required:	Y
<u>99E</u> :)		₹	

Activity Description: PROVIDES INSTRUCTIONS FOR APPLYING ELECTRICAL FOWER TO THE DATA PROCESSING SUBSYSTEM (DPS) AND PERFORMING DPS SUBSYSTEM LEVEL TESTS TO VERIFY SYSTEM READINESS TO SUPPORT ORBITER CHECKOUT AND PROCESSING.

Personnel:	<u> Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	1	4.0			
Elec. Tech:	3	12.0			
Quality:	62	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	(2)	Ø.Ø	N/A		
Engineerings	Ø	Ø. Ø	NZA		
Totals	4	16.0		Timer	4.0

Issues: FAULT DETECTION :

Technology Need Description:

diferial sui lau lakaadan di Uorq kir dalikkilina dosadi diakaa asaa dalikaada.

Seq. Task No: 74.00	Ø Facility: OF		OMI Page Count:	738
<u>OMI No</u> : V1037	<u>OMI Title</u> : A	MMONIA BOILER	SERVICING, OPERATI	ONS
AND DESERVICING (LPS)		,		
<u>Subtask OMI(s)</u> : I2003	, M2Ø63	, M3Ø11	, M3 02 2	9
M3039 , W3103	, S9ØØ1VL1	, V9Ø14	,	,
,	,	,	,	
<u>Prerequisite Task OMI:</u>				
<u> Hazard</u> : Y <u>Level</u> :	<u> Vehicle Power</u>		<u>.CC Support Requir</u>	<u>ed:</u> Y
<u>GSE</u> : S7 0-0 654 ,	S70-0776 , S70	-1201-1 ,	S70-1201-2 ,	
570-1201 , $570-1$	211 , S70-0695	-3 ,		

Activity Description: TO PERFORM OPERATIONS NECESSARY TO SERVICE, DE-TANK AND SAFE THE NH3 STORAGE TANKS AND TO CONNECT THE NH3 VENT, OPERATE NH3 BOILER AND DE-TANK.

<u> Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
<u>Mech. Tech</u> :	7	168.0			
Elec. Tech:	3	72.0			
Quality:	Ø	0.0	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	Ø	0.0	N/A		
Engineering:	Ø	0.0	N/A		
<u>Total</u> :	1 Ø	240.0		Time:	24.0

<u>Issues</u>: COST/MANHOURS : DESIGN CRITERIA : REQUIREMENTS :

Technology Need Description:

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Technology Identification Sheet

<u>Sec. Task No</u> : 75.000 <u>OMI No</u> : V1177 CHECKOUT (LPS)		OPF HEADS UP DIS	<u>Omi Pege Count</u> : 147 PLAY SYSTEM (HUDE, PDU)
<u>Subtask OMI(s)</u> :	'n	'n	9
4	\$	ÿ	Ч
ÿ	4	"	V
Prerequisite Task OMI: Hazard: N <u>Level</u> : GSE:	<u>Vehicle Pow</u>	<u>er Required:</u> Y	LCC Support Required: Y

Activity Description: TO FUNCTIONALLY VERIFY PROPER OPERATION OF HEADS OF DISPLAY ELECTRONICS UNIT (HUDE) AND PROPER OPERATION OF DILOT DISPLAY ENT S (POU).

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	1_	4.0			
Elec. Tech:		12.0			
Quality:	②	Ø . Ø	N/A		
LCC Ops:	(2)	\boxtimes . \boxtimes	NZA		
Supports	(Z)	Ø.0	NZA		
Engineerings	(2)	$ ot\!\! $. $ ot\!\! $	NZA		
The state of the s	4].	16.0		Timez	4.3

<u>losues</u>: FAULT DETECTION :

alide e je etata

Technology Need Description:

SEE TIS 57 (V1203)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Deg. Task No:76.000Facility: OPFOMI Page Count: 123GMI No:V1028OMI Title: DEDICATED DISPLAY AND DISPLAY DRIVERUNIT CHECKOUT (LPS)C9001,

Prerequisita Task OMI:

Hazard: M Level: 09E:

<u>Vehicle Power Required:</u> Y <u>LCC Support Required:</u>

Activity Description: TO FUNCTIONALLY VERIFY PROPER OPERATION OR THE DISPLAY DRIVER UNITS (DDU'S) AND THE PROPER OPERATION ACCURACY AND INTEGRITY OF THE DEDICATED DISPLAYS (FORWARD, LEFT HAND AND RIGHT ADI, AMI, AVVI, HSI AND SPI AND AFT ADI)

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	i A.	4.0			
Slec. Tech:	3	12.0			
Quality:	Ø	Ø. Ø	N/A		
100 Ops:	7	20.20	NZA		
Supporti	Ø	Ø.Ø	NZA		
Engineering:	<u>(2)</u>	Ø. Ø	NZA		
Total:	4	16.0		Time:	4,2

<u>issues</u>: FAULT DETECTION :REQUIREMENTS :

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

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Technology Identification Sheet

S <u>eq. Task No</u> : 77.000 <u>OMI No</u> : V1080	<u>Facility:</u> OMI Title:	OPF MULTIFUNCTION	CMI Page Co	
(MCDS) CHECKOUT (LPS)				
<u>Subtask OMI(s)</u> : 83500	, 89001	, V9001VI	_ 1 _ 3	
₹	y	7	9	
5	7	ų.	9	
<u> Prerequisite Task OMI:</u>				
<u>Hazard:</u> N <u>Level</u> :	<u> Yehicle Powe</u>	er Required: Y	LCC Support	Control in the
BBE :	,		9	7
à	1.	ii ii		

Activity Description: TO PROVIDE FUNCTIONAL CHECKOUT OF THE ORBITER MODE CONSISTING OF ON-BOARD DISPLAY ELECTRONICS UNITS (DEU), DISPLAY DATES (DEU AAL KEYBOARD UNITS (KBU).

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Femarks		
Mach. Tech:	5	20.0			
Elec. Tech:	Z	12.0			
<u>Quality</u> :	\bigcirc	② . ②	NZA		
LCO Gps:	Ø	Ø.Ø	NZA		
Support:	(∑)	Ø. Ø	MZA		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
Total	8	32.0		Times	4.0
<u>Issues</u> : FAULT DE	TECTION :RE	QUIREMENTS	W E		:

Tschnology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (Vi@03)

-(LPS)	<u>Seg. Task No</u> : 78.2000 <u>Omi No</u> : Vii7i	7 (4) (4)		OMI Page Count: 597 RIZATION OPERATION
Subtask Skriev, tolon , tolon , all tolon		, 06150	, 06225	, Ga25V1291
V1282 , V5057 , v	V1202 , V5057	Ģ	ņ	∜
9	ÿ	9	9	Ţ
<u>Prerequisite Task OMI:</u> <u>Bazard: Y Level: Vehicle Power Required: Y LCC Support Required</u>	<u> Hazard: Y Level</u> :	<u>Vehicle Power</u>	<u>Required: Y LC</u>	<u>OC Support Required</u> :
<u>ese a</u>	<u>65E</u> :	ij	ŋ	#

Activity Description: REPETITIVE TASK OMI TO ALLOW MPS/S3ME SYSTEMS TO BE PRESSURIZED TO SUPPORT VEHICLE FLOW.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	23	Ø.Ø	NZA		
Elec. Tachi	Ø	Ø.Ø	N/A		
CALLA 2 1 2 V 4	<u>(2)</u>	0.0	NZA		
LIC 7254	Ø	Ø.0	N/A		
Bupport:	Ø	Ø. Ø	NZA		
Engineering:	(Z)	Ø.Ø	NZA		
Totals	Ø	Ø. Ø		<u>"imer</u> :	0.0

Issues:

Technology Need Description:

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Technology Identification Sheet

<u>Seq. Task No</u> : <u>OMI No</u> : V1007 PNTSSURE TESI	7	Facility: OMI Title: MAINTENANCE		OMI Page Count: 571 LEAKAGE/POSITIVE	
Subtask OMI(s		, V3511	, V3512	, veet	7
V5067	9	,	9	Ý.	7
	ñ	3	9	5	
Preneguisite Hazard: N <u>Lev</u> 39E: A70-076° 870-0858	<u>cel</u> :			LCC Support Pequired: 872-2534 ,	Y

Activity Description: TO DETERMINE THE LEAKAGE ACROSS THE ORBITER'S PUBBLAGE AND STRUCTURAL BULKHEADS AND FOR COMPARTMENTS TO MAINTAIN A POSITIVE PRESCUES UNDER NORMAL PURGE FLOWRATES AND INSTRUCTIONS TO REMOVE AND REPLACE DVD VENT FILTERS.

Rarsonnel:	Head Count	Man Hours	Remarks		
<u>Mech. Tech</u> :	ery Ala	48.0			
Elec. Tech:	Circ.	48.Ø			
Quality:	Ø	Ø . Ø	NZA		
LCC Ops:	¥2)	Ø. Ø	MZA		
Support	Ø	0.10	NZA		
Engineering:	(3	Ø.Ø	NZA		
Total:	4	96.Ø		<u>Time</u> :	24.7

ISSUES: MAINTAINABILITY : DESIGN CRITERIA :TIME/ONØLINE :

Technology Need Description:

Seg. Task No: 80.000 Facility: OPF
OMI Title: PAYLOAD BAY Facility: OPF DMI Page Lount: 196
OMI Title: PAYLOAD BAY DOOR CLOSING-MORIZONTA.

, V3500 , V3508 , V9201VLi Bultask CMI(S): U3119

Prerequisite Task CMI:

 Hazard:
 Y Level:
 Vehicle Power Required:
 Y LCC Support Required:

 80E:
 A70-0883
 , C70-0807
 , C70-0870
 , C70-0826

 -00-2529
 , H70-0728
 , H70-0329
 , H72-0826-6

<u>Activity Description:CLOSING OF PAYLOAD BAY DOORS PRIOR TO ROLLOUT FROM OPT.</u>

Personnel:	Head Count	Man Hours	Remarks		
<u> Mech</u> i	had'	96.Ø			
Trovana Teoria v	4	1 2 . 2			
<u>kuality</u> i	②	Ø.Ø	NZA		
	2	$\mathbb{Z}_{+}\mathbb{D}$	NZA		
<u> </u>	(Z)	Ø.Ø	N/A		
Englo-Hering*	2	Ø . Ø	N/A		
	9	128.0		T1003	14.0

Technilody Need Description:

Topmology Candidates Identified:

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Seq. Task No: 81.000 Facility: OPF OMI Page Count: 246 OMI Title: ORBITER FLIGHT CONTROL FREQUENCY OMI No: V1034 RESPONSE TEST (LPS) , V9002.08 , V5057 , **V90**22 <u>Subtask OMI(s)</u>: 83500

Prerequisite Task OMI:
Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y

GSE: A70-0999 , S72-0841 , H70-0570 ,

Activity Description: DEMONSTRATE THE DYNAMIC PERFORMANCE OF THE FLIGHT CONTROL SYSTEM BY CONDUCTING A FREQUENCY RESPONSE TEST (FRT) AND/OR A STEP RESPONSE TEST ON THE FOLLOWING: AEROSURFACES, MPS-TVC SYSTEM.

Personnel:	Head Count	Mar Hours	Remarks		
Mech. Tech:	Ø	Ø.Ø	NZA		
Elec. Tech:	Q()	Ø. 3	NZA		
Quality:	Q:	Ø.Ø	NZA		
LCC Ops;	Ø	Ø.Ø	NZA		
Support	2	6.0	N/A		
Engineering	Ø	Ø.Ø	N/A		
Total:	 	Ø., Ø		Time:	Ø.Ø

ISSUES: FAULT DETECTION : DESIGN : YTIJIBANIATNIAM:

Technology Need Description:

SEE TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

<u>Seq. Task No</u> :	Facility: OMI Title:		OMI <u>Page Count</u> : 122 TAND CENTER OF G RAVIT	
DETERMINATION USING PLATFORM	SCALES AND	OPF PLATFORM L	IFTING SYSTEM	
Subtask OMI(s):	7	7	•	,
,	,	y	•	ל
•	5	7	,	
<u> Prerequisite Task OMl:</u>				
<u>Hazard</u> : Y <u>Level</u> :	<u>Vehicle Fow</u>	<u>er Required</u> : N	LCC Support Required:	N
<u>GSE</u> : A70-0544 , A70-06	20 , I	C7 0-0 894	, H70-0508	
H7 0-0 570 , H7 0-0 758	, P72-10	001,		

Activity Description: TO CONFIGURE FOR AND PERFORM A THREE POINT ORBITER WEIGHING

<u>Personnel</u> :	Head Count	Man Hours	Remarks		
<u>Mech. Tech:</u>	15	192.0			
Elec. Tech:	Ø	Ø.Ø	NZA		
<u>Quality</u> :	₩.	Ø. Ø	N/A		
LCC Ope:	(C)1 Veri	Ø.Ø	NZA		
<u>Support</u> :	Ø	Ø . Ø	N/A		
<u>Engineer:na</u> :	⊘)	Ø.Ø	N/A		
<u>Total</u> :	1 é	192.C		Time:	12.0
<u>Issues</u> : DEC16N(G	er:	EQUIPEMENTS	:TIME/O	N-LINE	:003T/MANHOURS

Technology Need Description:

<u>Seq. Task No</u> : 83.000	Facility:	OPF	OMI Page Co	
OMI No: N52XX	OMI Title:	DOWN LARGO	OFFLOAD/DECONFI	. DUNC
Subtask OMI(s):	7	,	,	5
7	7	,	•	÷
,	,	5	ÿ	
<u>Prerequisite Task OMI:</u>				
<u> Hazard: Y Level:</u>	<u>Vehicle Fowe</u>	<u>er Required:</u>	N <u>LCC Support</u>	Required: N
GSE:	7		,	9
	-			

Activity Description: REMOVE ANY CARGO, CARGO EQUIPMENT OR CARGO RELATED SHUTTLE EQUIPMENT REMAINING FROM THE PREVIOUS MISSION.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	A _t	192.0			
Elec. Tech:	1	48.Ø			
<u>Quality</u> :	Q1	Ø.Ø	ANZ		
LCC Ops:	Q '	Ø.0	N/A		
Support:	Ø.	Ø.Ø	NZA		
Engineering:	Ø	Ø.2	N/A		
Total:	<u>=</u>)	240.0		Time:	48.0
<u>Issues</u> : DESIGN	: D9	ESISN ORITERIA	A :REQUIR	EMENTS	:

Technology Nesd Description:

Activity Description: INSTALL PAYLOAD ACCESS PLATFORMS IN THE ORBITER PAYLOAD BAY TO PROVIDE ACCESS TO CARGO AND AIRBORNE SUPPORT EQUIPMENT.

<u>Personnel:</u>	<u> Mesd Count</u>	<u>Man Hours</u>	Remarks		
M <u>eco. lestu</u>	-1	32.0			
Elec. Tech:	2	Ø. Ø	N/A		
Quality:	€ +. ;	Ø.Ø	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Supports	2	0.0	NZ S		
Engineering:	Ø	Ø.Ø	NZA		
<u>Total</u> :	4	32.0		Time:	8.Ø
<u>lssues</u> TIME/ON-	LINE : DE	IS I GN	:REGIURE	MENTS	:COST/MANHOURS

Technology Need Description:

Seq. Task No: 85.000 OMI No: N/A RECONFIGURATION	PROPERTY OF THE PROPERTY OF TH	OPF AFT FLIGHT:	OMI <u>Page Co</u> DECK DECONFIGUE	**************************************
<u>Subtask OMI(s)</u> :	•	5	•	7
3	,	,	•	*
5	•	,	7	
<u>Prerequisite Task OMI:</u>				
Hazard: N Level:	<u>Vehicle Powe</u>	<u>r Required:</u> 1	N <u>LCC Support</u>	Required: N
<u>09E</u> :	,		,	7
_	_	-		

Activity Description: REMOVE EQUIPMENT FROM AFT FLIGHT DECK USED TO SUPPORT CARGO ON PREVIOUS MISSION AND INSTALL EQUIPMENT REQUIRED TO SUPPORT NEXT MISSION.

<u>Fersonnel</u> :	<u>Head Count</u>	<u> Man Hours</u>	Remarks		
<u>Mech. Tech:</u>	(Z)	Ø. (2	NZA		
Elec. Tech:	Z .	336.Ø			
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	2.2	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø		NZA		
Total:	gere. Lan	336.0		Time:	168.0

ISSUES: DESIGN CRITERIA : REGIUREMENTS : COST/MANHOURS : TIME/ON-LINE

Technology Need Description:

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Technology Identification Sheet

Seq. <u>Task No</u> : 36.000	Facility:	OFF	<u>OMI Page Cou</u>	<u>int</u> : 0
OMI No: N/A	OMI Title:	PAYLOAD BAY (RECONFIGURATION	4 (MECH &
ELECT)				
<u>Subtask OMI(s)</u> :	5	,	•	•
ų	ÿ	,	,	5
>	7	•	5	
<u>Prerequisite Task OM1</u> :				
<u>Hazard: Y Level</u> :	<u>Vehicle Powe</u>	<u>er Required</u> : N	<u>LCC Support F</u>	Required: N
<u>69E</u> :	•		•	,

Activity Description: RECONFIGURE THE PAYLOAD BAY BRIDGES (KEEL & LONGERON) AND SMCH CABLES TO SUPPORT NEXT MISSION.

Personnel:	<u> Seal Count</u>	Man Hours	Remarks			
Mech. Tech:	4.	768.Ø				
Elec. Tech:	3	576. 0				
Quality:	Ø	0.0	NZA			
	Ø	0.0	N/A			
Supports	$\boldsymbol{\omega}$	0.0	N/A			
Engineerings	(?)	0.0	N/A			
Total:	7	1344.0		Time:	192.Ø	

Issues: TIME/ON-LINE : COST/MANHOUR : REQUIREMENTS : DESIGN CRITERIA

Technology Need Description:

Seq. Task No. 87.000	Facility:	ØPF	<u>OMI Page Co</u>	<u>unt</u> : 0
OMI No: N/A	OMI Title:	PAYLOAD BAY	RADIATOR FUNCT	IONAL/KU/
RMS/TANK SET OPPORTUNITY				
<u>Subtask OMI(s)</u> :	5	•	•	•
4	7	7	,	7
,	5	y	,	
Prerequisite Task OMI:				
Hazard: Y Level:	<u>Vehicle Powe</u>	er Required:	V <u>LCC Support</u>	Required: N
GSE:	,		•	7

Activity Description: SCHEDULE OPPORTUNITY TO PERFORM RADIATOR FUNCTIONAL TEST, KU BAND TEST, RMS INSTALLATION AND TEST, AND FUEL CELL TANK SET INSTALLATION/ REMOVAL.

Personnel:	Head Count	Man Hours	Remarks			
Mech. Tech:	$\Delta_{\frac{1}{2}}^{\frac{1}{2}}$	480.0				
Elec. Tech:	<u></u>	360.Ø				
Quality:	Ø	0.0	N/A			
LCC Ops:	Ø	Ø.Ø	N/A			
Support:	©	Ø.Ø	N/A			
<u>Engineering:</u>	(2)	0.0	NZA			
Total:	7	840.Ø		Time:	120.0	
<u>Total</u> :	7	840.Ø		Time:	120.0	

ISSUES: TIME/CN-LINE : COST/MANHOURS : DESIGN CRITERIA : REQUIREMENTS

Technology Need Description:

Seq. Task No: 88.000	Facility:	OF F	OMI Page Co	<u>unt</u> : 0
OMI No: N/A	OMI Title	: ORBITER/PAYL(DAD BAY INTERF	ACE
VERIFICATION				
<u>Subtask OMI(s)</u> :	•	,	3	,
•	•	7	*	9
5	5	,	•	
<u>Prerequisite Task OMI:</u>				
<u>Hazard:</u> N <u>Level</u> :	<u>Vehicle Pc</u>	ower Required: Y	LCC Support	<u>Required:</u> Y
<u>GSE</u> :	,	•	,	•

Activity Description: VERIFY THE COPPER PATHS OF THE ORBITER TO THE CARGO INTERFACE PLATE IN THE PAYLOAD BAY.

<u>Personnel</u> :	<u> Head Count</u>	<u>Man Hours</u>	Remarks			
Mech. Techt	2 3	Ø.Ø	N/A			
Elec. Tech:	4	283.0				
Buality:	77) 1607	Ø.Ø	NZA			
LCC Ops:	G	Ø.Ø	NZA			
Support:	(Z)	Ø . Ø	N/A			
Engineeringe	Ø	0.0	N/A			
Total:	4	289.Ø	Ţi	ime:	72.0	
<u>Issues</u> : COST/man	HOURS :T	IME/ON-LINE	:REQUIREME	ENTS	:DESIGN (CRITERIA

Technology Need Description:

<u>Seq. Task No:</u> 101.000 <u>OMI No</u> : T5244		'AB TPS CLOSEOUT,	OMI Page Count: 7 ORBITER JACK PADS	74
<u>Subtask OMI(s)</u> :	,	,	•	,
•	7	•	•	5
1	5	5	•	
Prerequisite Task OMI: Hazard: N Level: GSE:	<u>Vehicle Fower</u>	Required: N	LCC Support Required	<u>i</u> : N

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT ORBITER JACK PADS AND APPLY POLYURETHANE FOAM.

Personnel:	<u>Head Count</u>	Man Hours	<u>Remarks</u>		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	2)	Ø. Ø	NZA		
Quality:	$\widetilde{\mathcal{L}}$	0.0	N/A		
LCC Gps:	Ç/i	Ø.Ø	NZA		
Support:	<u>©</u>	Ø.Ø	NZA		
Engineerings	2	Ø.Ø	N/A		
Total:	(2)	Ø.Ø		Time:	16.0
Tesuesi	п ц		n s		R H

<u>lssues:</u>

Technology Need Description:

<u>Seq. Task No</u> : 100.000 <u>OMI No</u> : 80 00 4	<u>Facility</u> : VAB <u>OMI Title</u> : ORBITE	<u>OMI</u> R/ET MATE	<u>Page Count</u> : 52	6
<u>Subtask OMI(s)</u> : S3001 V1111 , V2084 V3509 , V3511 Ererequisite Task OMI:	, 93002 , , V2093 * , , V5029 ,	T12Ø3 V2Ø94 * V6Ø3Ø	, T1248 , V3508 , V9005	9
Hazard: Y <u>Level</u> : GSE: A70-0562 , A70-: P72-1001 , H70-0508	<u>Vehicle Fower Requi</u> 1268 , H7 0-0 597 , S7 0-080 5		upport Required 0768 ,	; Y

Activity Description: HOISTING AND MATING ORBITER TO EXTERNAL TANK AND UMBILICAL HOOK-UPS. 1) TO MATE ORBITER/ET UMBILICALS. 2) CONFIGURE GSE TO MONITOR ET TANK PRESSURE. 3) INSTALL ORB/ET UMBILICAL PURGE CURTAINS. 4) TO INSTALL ORB ORD AT VAS PER OMI V5029. 5) TO MATE T-0 UMBILICALS PER OMI V2093 AND V2094.

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	2 2	0.0	N/A		
Elec. Techi	Ø	Ø.Ø	N/A		
<u>Quality</u> :	(2)	Ø.Ø	N/A		
LOC Ope:	Ø	Ø.Ø	NZA		
Support:	©	Ø. Ø	NZA		
Engineering:	2	Ø. Ø	N/A		
<u>Total</u> :	$\mathcal{C}_{\mathcal{I}}$	Ø.Ø		Time:	88.0
Issues:	M E.		:		N U

Technology Need Description:

Seq. Tesk No: 102.000 Facility: VAB OMI Fage Count: 108
OMI No: T5048 OMI Title: INSTALL AND REMOVE INTERTANK ACCESS

KIT

<u>Subtask OMI(s)</u>: T6447 , ,

, Frerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N

GSE: A72-0853 , A78-3604 , A78-3605

Activity Description: INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

<u>Head Count</u>	Man Hours	Remarks		
Ø)	Ø. Ø	N/A		
Ø	0.0	N/A		
2	Ø.Ø	NZA		
Ø	0.0	NZA		
Ø	Ø.2	NZA		
(3	2. Ø	NZA		
7	Ø. Ø		Time:	4.0
	ପ ପ ଅ ଅ ଅ ଅ ଅ ଅ ଅ	Ø Ø.Ø Ø Ø.Ø Ø Ø.Ø Ø Ø.Ø Ø Ø.Z Ø Ø.Z	0 0.0 N/A 0 0.2 N/A 0 0.2 N/A	0 0.0 N/A 0 0.2 N/A 0 0.2 N/A

lssues:

Technology Need Description:

Activity Description: TO PROVIDE INSTRUCTIONS FOR THE SRB CLOSEOUT TASKS TO BE PERFORMED IN VAB HB-17-3 FROM PREPARATIONS FOR ET MATE THROUGH PREPARATIONS FOR ROLLOUT.

Fersonnel:	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	Ø)	0.0	N/A		
Quality:	Ø	Ø.Ø	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø.Ø	N/A		
Engineering:	(3)	Ø.Ø	N/A		
Total:	Q:	Ø.2		Time:	17.0

GSE:

<u>Issues:</u>

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)

Seq. Task No: 1 OMI No: T1201		cility: VAB I Title: ET	OM: VENT VALVE OPER	<u>C Page Count:</u> RATION - SS20	64
Subtask OMI(s): S	89 0 01 ,	T1001	y	7	Ģ.
9	,		,	,	•
Prerequisite Task Hazard: Y Level:	<u>Veh</u>			Support Require	<u>∍d</u> : Y
<u>GSE</u> : C72-1280	, 6//-0202-	XXX , E78-0	, , ,	•	

Activity Description: TO OPEN AND CLOSE THE ET VENT VALVES WITH THE ET MATED TO THE ORBITER IN THE INTEGRATION CELL.

Personnel:	<u>Head Count</u>	Man Hours	<u>Remarks</u>		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	Ø	Ø. Ø	N/A		
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	Ø. Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Ø	Ø.Ø	NZA		
Total:	Ø	0.0		<u>Time</u> :	4.0
<u>Issues</u> :	;		'i E		:

Technology Need Description:

<u>Seg. Task No</u> : 104.000 OMI No: T1203	Facility: \	/AB ET CONTINGENCY	<u>OMI Page Cou</u> PRESSURIZATI	
MATE HB-1/-3 Subtask OMI(s): Ti001	, T1002	3	,	ģ
7	,	•	,	5
Prerequisite Task OMI:	. Nebicle Four	, Required: N	LCC Support B	equired: N
<u>Hazard: N Level:</u> <u>GSE:</u> ,	AGUICIE LOMEL	Negatives. W	Lee Jappere R	,
•	•	5		

Activity Description: INITIATE ET LO2 AND LH2 TANK PRESSURE MONITOR. ACCOMPLISH CONTINGENCY PRESSURIZATION OF LO2 AND LH2 TANKS.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	(2)	0.0	NZA		
Elec. Tech:	0	Ø.Ø	NZA		
Quality:	Ø	Ø. Ø	NZA		
CCC Ops:	Ø	Ø. Ø	N/A		
Support:	Z 2	Ø.Ø	NZA		
Engineering:	979	Ø.Ø	N/A		
Total:	Ø	Ø. Ø		<u>Time</u> :	6.0
Issues:	:		:		5

Technology Need Description:

<u>Seg. Task No</u> : 106.000	Facility: VAB	<u>OMI Page Count</u> : 440
<u>OMI No</u> : SØØØ8	OMI Title: SHUTTLE INT	ERFACE TEST (LPS)
Subtask OMI(s): B1061	. 85003 . 5002	0 . S35 0 0
	,	· ,
5700 1 , 570 02	, T1249 , V114	, V3503 ,
V3 505 , V35 0 9	, V5027 , V502	9 , v900 2
<u>Prerequisite Task CMI:</u>		
<u>Hazard: Y Level</u> :	<u>Vehicle Power Required:</u>	Y <u>LCC Support Required</u> : Y
<u>GSE: E78-0006</u> , C70-1	1181 , C72-1128	, 070-0903 ,
C77- 020 2 , C72-0831	, C72-1127-2 , C	78-5 00 7

Activity Description: 1) VERIFY ORBITER/MLP INTERFACES.

- 2) VERIFY ORBITER/ET ELECTRICAL AND FLUID INTERFACES.
- 3) VERIFY ORBITER/SEB INTERFACES.
- 4) VERIFY FUNCTIONAL OPERATION OF GRE SYSTEMS.

Personnel:	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	Œ	73. C	NZA		
Elec. Tech:	€2!	Ø.Ø	NZA		
Quality:	. 1% Nave	Ø.Ø	NZA		
LCC Ops:	Ø.	0.0	N/A		
Supports	Ø	Ø. Ø	NZA		
Engineering	£2;	(3 . (2)	NZA		
Total:	Ø	Ø.Ø		<u>Yime</u> :	37.0
laguage	ï.		2		3

Technology Need Description:

Seq. Task No:	187.60	72 <u>Facility</u> : V	AB	<u>OMI Page Count:</u> 246	
OMI No: CROZE		CMI Title:	SHUTTLE FLIGHT	CONTROL INTEGRATED	
MEGTA (LPD:	man a men politic libra	F.4.500	To de Charles	T: E 64 (N. A	
Subtask <u>CMI(s)</u> : :	BIMAP	, B1009	, B1026	, E5Ø24	
35101 ,	SIESW	, SFØØ1	, 59 0 00	, V:123	
,		9	ÿ	5	
Prerequisite Tas	k oml:				
<u> Hazard:</u> Y <u>Level</u> :		<u>Venicle Fower</u>	Required: Y	LCC Support Required:	ĭ
<u>GSE</u> : A77- 0 179	ग्	872-8 750-1 ,	,	•	
4		•	•		

Activity Description: TO VERIFY COMMAND, FEEDBACK AND FAILURE DETECTION INTERFACES AND FUNCTIONAL OPERATION OF THE SHUTTLE SRB FLIGHT CONTROL SYSTEM.

	Mead Count	des Nours	Remarks		
form. Techt		Ø. 2	NZA		
Elest Twins	Ø.	Ø. Ø	NZA		
<u> </u>	v C	0.0	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	V)	2.8	NZA		
Engineering:	V2	Ø. Ø	N/A		
<u>Total</u> :	<u>@</u>	Ø. Ø		Time:	6.0
laskes:	ε. 1.		Q		2

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

Sec. Task No: 100.600	Eacility:	VAB	<u>OMI Fage Count:</u>	38
OMI No: T6248	OMI Title:	EXTERNAL TANK	(ET) PRE-MOVE	
INSPECTION				
<u>Subtask OMI(s)</u> : TSØ48	'n	•	,	5
1	ÿ	7	7	· .
8	9	7	•	
Prerequisite Task OMI:				
<u>Hazard:</u> N <u>Level</u> :	Vehicle Fow	<u>er Required:</u> N	LCC Support Requi	red: N
<u>65E</u> :	,		,	•
•		y		

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

<u>Personnel:</u>	Head Count	Man Hours	Remarks		
Mech. Tech:	6	Ø.Ø	NZA		
Elec. Tech:	75. 95.5	Ø.Ø	N/A		
Quality:	<u> (2</u> 4	Ø. Ø	N/A		
LCC Ops:	Ø.	Ø. Ø	NZA		
Support:	Ø	Ø _ Ø	N/A		
Engineering:	(P)	Ø.Ø	NZA		
Total:	2	0.0		Time:	10.0
Isaues:	p e		:		:

Technology Need Description:

<u>Seg. Task No</u> : 109.000 <u>OMI No</u> : A5214	<u>Facility</u> : VAB <u>OMI Title</u> : SHUTTLE TRA	OMI <u>Page Count</u> : 78 ANSFER AND MATE TO PAD
<u>Subtask OMI(s)</u> : B5306 M3139 , 03006 83001 , 83002	, C9002 , C901 , 03016 , 0500 , T6248 , V111	, 06014
<u>Prerequisite Task OMI:</u> <u>Hazard: Y Level:</u> <u>GSE:</u> ,	Vehicle Power Required:	N <u>LCC Support Required</u> : Y

Activity Description: TO PROVIDE SEQUENTIAL INSTRUCTIONS FOR KSC OPERATIONS TO EFFECTIVELY TRANSFER THE SSV/MLP FROM VAB TO PAD. DOCUMENT IS WRITTEN FOR THE CT TO MOVE UNDER THE MLP ON THE FIRST DAY AND THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	©	0.0	NZA		
Elec. Tech:	Ø	Ø.Ø	N/A		
Guality:	Ø.	Ø. Ø	N/A		
LCC Ops:	S á	Ø.0	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineering:	Æ	Ø.Ø	NZA		
Total:	Ø.	Ø.Ø		Time:	10.0
<u>Issues</u> :	=		tr *		2

Technology Need Description:

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Technology Identification Sheet

Activity Description: TO INSTALL GO2 PRESS LINE BLANK-OFF PLATE TO SUPPORT ORBITER ENGINE/PROPULSION SYSTEM TESTING.

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	0.0	N/A		
<u> Elec. Tech:</u>	Ø.	Ø. Ø	N/A		
<u>Cuality</u> :	2	Ø.Ø	NZA		
<u>LCC Ops</u> :	<u>Q</u>	Ø.O	NZA		
<u>Support:</u>	Q^{*}	0.0	N/A		
<u>Engineering</u> :	ÇÇ	Ø.0	N/A		
Total:	(2)	3. 0		<u>Time</u> :	5.0
Teannar					

<u>lssues:</u>

Technology Need Description:

<u>Seq. Task No</u> : 111.00 OMI <u>No</u> : T1204 .	OMI Title:	VAP INSTALLATION/F	OMI <u>Page Count</u> : 78 REMOVAL OF GH2 PRESS	
LINE BLANK-OFF PLATE, Subtask OMI(s): G9201	INTEGRATION CELL, 89001	, T1001	, T1050 ,	•
, Prerequisite Task OMI:	, Vehicle Pow	er Required: N	, LCC Support Required:	Y
<u>Hazard: Y Level:</u> <u>GSE:</u> A78-3623-01	A78-3623-02 ,	C78-1229	, P78-3137-1-101 ,	

Activity Description: TO INSTALL GH2 PRESS LINE BLANK-OFF PLATE, TO SUPPORT ENGINE/PROPULSION SYSTEM TESTING IN VAB INTEGRATION CELL. THE BLANK-OFF PLATE MAY BE REMOVED, IF REQUIRED, AT PAD A PER OMI T1401, OR IN THE INTEGRATION CELL PER THIS CMI.

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	(2)	Ø. Ø	NZA		
Elec. Tech:	(2)	Ø.Ø	N/A		
Quality:	Œ	Ø.Ø	N/A		
LCO Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	0.0	N/A		
Engineering:	Ø	Ø.Ø	NZA		
Total:	Ø	Ø. Ø		Time:	5.0
T. en en 1 en an a	Ç		2		<u>.</u>

<u>Issues</u>:

Technology Need Description:

<u>lactinglogy Identification Sheet</u>

<u>Seq. Task No</u> : 200.000 <u>OMI No</u> : A5214	Facility: PAD OMI Title: SHUTTLE TRANS	<u>OMI Page Count</u> : 152 BFER AND MATE TO PAD
<u>Subtask OMI(s)</u> : B5306 M3139 , G3004 S3 00 1 , S3002 <u>Prerequisite Task OMI</u> :	, C9002 , C9010 , 03016 , 05001 , T6248 , V1111	, M3051 , , Q6014 , , V3 50 9
<u>Hazard</u> : Y <u>Level</u> : <u>GSE</u> : ,	<u>Vehicle Power Required</u> : N	LCC Support Required: Y

Activity Description: TO PROVIDE SEQUENTIAL INSTRUCTIONS FOR KSC OPERATIONS TO EFFECTIVELY TRANSFER THE SSV/MLP FROM VAB TO PAD. DOCUMENT IS WRITTEN FOR THE CT TO MOVE UNDER THE MLP ON THE FIRST DAY OF THE MOVE AND MATE TO PAD ON SECOND DAY OPERATION.

<u>Personnel</u> :	Mead Count	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	©	Ø.Ø	N/A		
Elec. Tech:	(71	Ø.Ø	N/A		
<u>Quality</u> :	2	Ø. Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support:</u>	V 2	0.0	N/A		
<u>Engineering:</u>	Ø	2.0	N/A		
<u>Total</u> :	<u>(Z)</u>	0.0		Time:	8.0
<u>Issues</u> :	* "		P 5		:

Technology Need Description:

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Technology Identification Sheet

Seq. Task No:	201.000	Facility	•		Page Cou		
OMI No: 50009		OMI litl	e: SHUTTLE	LAUNCH PAD	VALIDATI	HIIW MU.	
CONTINGENCY APU	CONFIDENCE R	JN (LPS)	24 FOR ,	170 GERARAT	F TASK	CALLOUTS	
<u>Subtask OMI(s)</u> :	SEE PAGE 15	, IHKU	24 FUR ,	1// 25/ 25/	. , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		9
•		•	7		,		
,		,	,		,		
Prerequisite Tas	<u>sk OMI</u> :			1. V 100	Cumment F	Peauseed:	V
Hazard: Y <u>Level</u> :	'	<u>Vehicle F</u>	ower Requir	<u>eo</u> : Y <u>lll</u>	pubbar c :	VERGUIT ER	,
GSE: H70-0865	, A70-06	43-2	7	,		,	

Activity Description: PERFORM/VERIFY STS/MLP/PAD ELECTRICAL/PNEUMATIC/MECH.
INTERFACES. PERFORM/VERIFY LOX PAD/MLP MATE AND FUNCT CHECKS.
PERFORM/VERIFY LH2 PAD/MLP MATE AND FUNCT CHECKS. PERFORM/VERIFY GOX VENT
ARM/ET ALIGNMENT. VERIFY BSV RF/INSTRUMENTATION INTERFACES WITH THE PAD.
PERFORM/VERIFY PERFORMANCE OF APU'S VIA APU CONFIDENCE RUN PERFORMANCE TEST.

Personnel:	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ö	Ø.Ø	NZA		
Elec. Tech:	U	Ø. Ø	N/A		
Quality:	Ø	0.0	NZA		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.Ø	N/A		
Engineerang:	7.	Ø.Ø	NZA		
Total:	Ø	Ø.Ø		<u>Time</u> :	34.0
management of the section of the section of					

Issues:

Technology Need Description:

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Technology Identification Sheet

<u>Seq. Task No:</u> 202.000 <u>OMI No:</u> **S00**17 <u>Facility</u>: PAD OMI Fage Count: 949 OMI Title: TERMINAL COUNT DEMONSTRATION (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR 66 SUBTASK, LISTING

Prerequisite Task OMI:

 Hazard: Y Level:
 Vehicle Power Required: Y
 LCC Support Required: Y

 GSE: S70-1232
 , S70-0832-2
 , S72-0685-1
 , S72-1107-1
 ,

070-0749 , 070-1226-3 , 570-0547 , 570-0548

Activity Description: 1) TO DEMONSTRATE THE SEQUENCE OF CREW OPERATIONS REQUIRED TO PREPARE FOR SHUTTLE LAUNCH FROM CREW SUITING THROUGH GLS CUT-OFF (T-5 SEC.) 2) TO EVALUATE CREW OPERATION TIME LINES.. 3) TO EVALUATE THE INTER-AGENCY INTERFACES.. 4) TO INTERFACE THE FLIGHT CREW AND THE LAUNCH TEST TEAM DRESS REHEARSAL. 5) TO DEMONSTRATE LAUNCH ABORT SAFING AND RECYCLE TO T-20 MIN.

<u>Personnel:</u>	Head Count	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Q3	0.0	N/A		
<u>Elec. Tech</u> :	Ø:	Ø.Ø	N/A		
<u>Guality</u> :	Z	Ø.0	NZA		
<u>LCC Ors</u> t	Ø	Ø. Ø	NZA		
<u>Support</u> :	②	Ø.0	N/A		
Engineering:	Ø	Ø Ø	N/A		
<u>Total</u> :	1 2)	Ø.Ø		<u>Time</u> :	24.0

Issues: TIME/ON-LINE : COST/MANHOURS : REQUIREMENTS :

Technology Need Descriptions

<u>Seq. Task No</u> : 203.000 <u>OMI No</u> : V1202	Facility: OMI Title:	PAD <u>DI</u> MPS/SSME HELIUM :	1 * 1 * 1 * 1 * 1 * 1 * 1 * 1 * 1 * 1 *	20			
<u>Subtask OMI(s)</u> : V1171 G61 0 5	, V1122	, G6250 ,	, G62 0 5 ,				
Frerequisite Task OMI:	, Vobjela Pows	, er Required: Y LC	: C Support Require	<u>:d</u> : Y			
Hazard: N Level: Vehicle Power Required: Y LCC Support Required: Y GSE: U72-1186-2 , S72-0685-X , A70-0668 , A70-0698 , C70-0743-7-068 , C70-1187-001 , F70-0033-1 , S70-0534							

Activity Description: PERFORM LEAK CHECK OF ISOLATED MPS/SSME SYSTEMS WITH HELIUM USING HAZ GAS DETECTION SYSTEM.

Personnel: Mech. Tech: Elec. Tech: Quality: LCC Ops: Support: Engineering:	Head Count 0 0 0 0 0 0 0	Man Hours Ø.Ø Ø.Ø Ø.Ø Ø.Ø Ø.Ø	Remarks N/A N/A N/A N/A N/A		
<u>Engineerinc</u> : <u>Total</u> :	Ø	0.0		<u>Time</u> :	44.0
<u>Issues</u> : TIME/CN-	LIME :CO	ST/MANHOURS	-		n F

Technology Need Description:

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Technology Identification Sheet

Seq. Task No: 204.000

Facility: PAD

OMI Page Count: 496

OMI No: 50024

OMI Title: PRELAUNCH PROPELLANT SERVICING (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF , 55 DIFFERENT , SUBTASK OMI'S ,

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: Y LCC Support Required: Y

<u>GSE</u>: S70-0547 , S70-0548 ,

Activity Description: SERVICES HYDRAZINE FOR EACH APU FOR NORMAL FLIGHT AND LOAD NITROGEN TO THE REQUIRED FILL ENVELOPE AFTER HYDRAZINE SERVICING. SERVICES 20 FRCS, ARCS, OMS PROPELLANT TANKS AND GHE, GN2 TANKS TO FLIGHT LOADS WITH N204, MMH, GHE AND GN2. SERVICES SRB HYDRAULIC POWER UNIT (HPU) FUEL SUPPLY MODULE WITH FUEL AND GN2 PRECHARGE. SERVICES PRSD SYSTEM WITH LO2 % LH2.

<u> Fersonnel</u> :	<u> Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	€. W.1	0.0	N/A		
Elec. Tech:	Ø	Ø.O	NZA		
<u>Quality</u> :	Ø	0.0	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support</u> :	∇	Ø.Ø	N/A		
<u>Engineering</u> :	Ø	Ø.Ø	NZA		
Total:	<u>(E</u>	Ø.ø		Time:	100.0

<u>Issues</u>: TIME/ON-LINE : COST/MANHOURS : DESIGN

:REQUIREMENTS

Technology Need Description:

Facility: PAD
OMI Title: FINAL ORDNANCE Ohl Fage Count: 266 <u>Seq. Task No</u>: 205.000

OMI No: S5009 INSTALLATION/CONNECTION AND AFT CLOSEOUT (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF , 42 SEPARATE , SUBTASK OMI'S ,

Prarequisite Task OMI:

Vehicle Fower Required: Y LCC Support Required: Y Hazard: Y Level: GSE: C72-1127-2

Activity Description: 1) INSTALL SRSS FLIGHT CODE. 2) PERFORM SRSS OPEN/CLOSED LOOP TESTS. 3) PERFORM POWER OFF STRAY VOLTAGE CHECKS, SHIELD TO GROUND RES. CHECKS & ELECT CONNECT ALL PYRO DEVICES. 4) CONNECT ET & SRB SRSS CDF ASSY'S TO SWA DEVICES 5) ET I/T CLOSECUT. 6) CONNECT SRB IGN SWA CABLES & FULL PINS. 7) PIC RES & ROTATION, 8) SRB MECH CLOSEOUT 9) CARGO STRAY VOLTS 10) FINAL CONF

Personnel:	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	<u>C</u> r	Ø . Ø	NZA		
Quality:	Ø	Ø. Ø	NZA		
LCC Ops:	2	Ø.Ø	N/A		
Support:	ä	Ø. 0	NZA		
Engineering:	Ω.	Ø.0	NZA		
Total:	0	Ø.0		<u>Time</u> :	100.0

Issues: SAFETY Technology Need Description:

> SEE TIS 57 (Vi003) SEE TIS 11 (V5012)

:TIME/ON-LINE :

Technology Candidates Identified:

SEE TIS 57 (V1003) SEE TIS 11 (V5012)

OFFICER QUALITY

Technology Identification Sheet

<u>Seq. Task No</u> : 206.000 <u>OMI No</u> : Y9002.0110	<u>Facility:</u> OMI Title:	PAD HYDRAULIC FOWER	OMI Page Coun UP/DOWN	<u>t:</u> 9 0 4
<u>Subtask OMI(s)</u> : S3500	, V1133	, V9ØØ1	,	,
y	•	,	7	•
ų	,	y	,	
<u>Prerequisite Task OMI:</u>				
<u>Hazard: Y Level:</u>	<u>Vehicle Powe</u>	<u>r Required</u> : Y <u>L</u>	<u>CC Support Re</u>	<u>quired:</u> Y
GSE: A70-0696 , C70-0	894 , S	72-0841 ,	S70-0843	7
\$7 0-0 952 , \$7 0-0 861-1	, 872 -0 8	44-3 , 572-0	844-4	

Activity Description: APPLY HYDRAULIC GROUND POWER TO ORBITER TO SUPPORT HYDRAULIC OR ANY ASSOCIATED SUBSYSTEMS TESTING.

Personnel:	Hoso Count	Man Hours	<u>Remarks</u>		
<u>Mech. Techi</u>	Ž	0.0	NZA		
Elec. Test	Ø	Ø.Ø	NZA		
Quality:	(2)	Ø. Ø	N/A		
LCC Ops:	(% 92	Ø.Ø	N/A		
Support:	Σ	Ø.Ø	N/A		
Engineerings	Q;	Ø . Ø	N/A		
Total:	3	0.0		Time:	28.0

Issues: DESIGN CRITERIA :REQUIREMENTS :COST/MANHOURS :

Technology Need Description:

2.3

Sec. Task No: 207.	000 Facility:	PAD	<u>OMI Page Count</u>	: 539
OMI No: V1045	OMI Title:	SSME LEAK ANI) FUNCTIONAL (VER	FICAL)
(LFS) (CONTINGENCY)				
<u>Subtask OMI(s)</u> :	1	,	•	5
•	•	7	7	7
,	5	7	,	
Prerequisite Task OM	<u> </u>			
Hazard: Y Level:		<u>er Required:</u> N	<u>LCC Support Req</u> i	<u>uired:</u> N
GSE: A70-0668	, A70-0698-1 , '	C7 0-090 2	, C70-0907	7
570-0902 . S70	,-09 0 5 ,	•		

Activity Description: 1) PERFORM CONTINGENCY LEAK AND FUNCTIONAL C/O IN VERTICAL 2) VERIFY SSME SYSTEM INTEGRITY FOLLOWING A PAD ABORT AFTER MAIN ENGINE IGNITION.

<u>Personnel</u> :	<u> Head Count</u>	Man Hours	Remarks		
Mech. Tech:	2	Ø.Ø	N/A		
Elec. Tech:	\mathbb{C}_2	៤.ឰ	NZA		
Quality:	1 2	Ø.Ø	NZA		
LCC Ope:	Ø	❷.⊘	N/A		
Support:	Ø.	Ø. Ø	N/A		
Engineeriaga	C_{λ}	Ø.0	N/A		
Total:	Ø	Ø. Ø		Time:	30.0
<u>leguee</u> :	ħ		:		b1 15

Technology Need Description:

. -_ .

 Seq. Task No:
 208.000
 Facility:
 PAD
 DMI Fage Count:
 112

 OMI No:
 \$1005
 OMI Title:
 LO2 TOTAL SYSTEM DEW POINT AND ET

 CONDITIONING
 Subtask OMI(s):
 G6150
 , 69101
 , L02-9006
 , M3011

 M3020
 , M3500
 , 89001
 , V1171
 , V5057

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y GSE: S72-1106-2

ACTIVITY Description: TO PURGE THE EXTERNAL TANK, TSM VENT, ORBITER AND ENGINES, AND ENGINE BLEEDLINE WITH GN2 FROM THE S72-0685-3 PANEL FOR A DEWPOINT OF 113 PPM H20 MAXIMUM. TO VERIFY REPLENISH FILL SYSTEM AND VAPOROZER FOR A DEW POINT OF 22 PPM H20 MAX PER G2124. TO PURGE MAIN FILL AND DRAIN INCLUDING CROSS COUNTRY LINE THRO THE TSM DRAIN LINE WITH GN2. FOR A DEW POINT OF 113 PPM.

<u>Personnel:</u>	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech: Tech:	Ø	0.0	N/A		
<u>Elec. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Quality</u> :	Ø	0.0	NZA		
<u>LCC Obs</u> :	Ø	0.2	NZA		
<u>Support</u> :	Ø	Ø.Ø	N/A		
<u>Engineering:</u>	\bigcirc	0.0	N/A		
<u>Total</u> :	Ø	Ø. Ø		Time:	12.0

Issues:

Technology Need Description:

Technology Candidates Identified:

OF POOR QUALITY

Facility: PAD OMI Page Count: 0 <u>Seg. Task No</u>: 209.000 .CMI Title: ET/FACILITY LHZ SYSTEM CONDITIONING OMI No: S1005

, 39201 , T1050 , V9001 , SCTP-LH2-9006 ,

<u>Subtask OMI(s)</u>: 06250 V3**500** , V5057

<u> Prerequisite Task OMI</u>:

Vehicle Power Required: Y LCC Support Required: Y

Hazard: Y Level: <u>GSE</u>:

Activity Description: TO PURGE AND SAMPLE THE ET LH2 TANK AT LC39A. TO PURGE AND SAMPLE THE LH2 STORAGE AND TRANSFER SYSTEM.

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	2:	Ø.Ø	N/A		
Elec. Teshi	Ø	Ø.Ø	N/A		
Quality:	Ø	0.0	N/A		
LCC Ops:	 52λ	Ø.Ø	N/A		
Support:	ē	Ø.Ø	N/A		
Engineering:	Ø	Ø.0	NZA		
Total:	Ø	Ø.Ø		Time:	12.0

Issues:

Technology Need Description:

<u>Seg. Task No</u>: 210.000 <u>OMI No</u>: V1103.01-03 <u>Facility</u>: PAD OMI <u>Page Count</u>: 510 OMI Title: EXTRAVEHICULAR MOBILITY UNIT/FUNCTIONAL CHECKOUT (LPS) , 53500 , V3502 Subtask OMI(s): M3095 , M6020 , V5Ø57 , V6003 , V5Ø57 V3512 , V3528 V9001, VL1 Prerequisite Task OMI: Vehicle Power Required: Y LCC Support Required: Y Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: S70-0962 , C70-0743-001 , S70-0698-1 , S70-0698-3 , 870-0834-1 , 870-0834-2 , 870-0787-2 , 872-1106-1

Activity Description: PROVIDE EMU INTERFACE VALIDATION TESTS AT OPF. PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (TWO UNITS)
PROVIDE EMU FUNCTIONAL CHECKOUT AT PAD. (2 EMU'S AND 1 SPARE)

<u>Fersonnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	Ø	Ø.Q	N/A		
Elec. Tech:	Ø	0.0	N/A		
Quality:	Ø	Ø.Ø	N/A		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	ଉ.ପ	N/A		
Engineering:	Ø	Ø.Ø	N/A		
Total:	Ø	0.0		<u>Time</u> :	12.0

Issues: FAULT DETECTION :TIME/ON-LINE :DESIGN CRITERIA :

Technology Need Description:

SEL TIS 57 (V1003)

Technology Candidates Identified:

SEE TIS 57 (V1003)

Seq. Task No: 211.000	<u>Facility</u> : F	PAD <u>Q</u>	<u>MI Page Count</u> : 2	4Ø
<u>OMI No</u> : V1149	OMI Title:	T-Ø UMBILICALS I	NTERFACE LEAK CHE	DKS
(LPS)		0.000	25224	
<u>Subtask OMI(s)</u> : 66105	, G615 0	, G62 0 5	, 59 00 1	
53 500 , T1101	, T1201	, V9Ø17	, V5Ø57	,
V1171 ,	,	7	•	
<u> Prerequisite Task OMI</u> :				
Hazard: Y Level:			<u>C Support Require</u>	₫: Y
<u>GSE</u> : F70-0027 , S70-	-0517 , S7	7 0-05 29 , S	70-0823-1,	
\$72- 068 5-1 , \$72- 0 686-	-i , 572-11 0	27-1 , S72-11	Ø7-13	

11.9

Activity Description: 1) LEAK CHECK THE INTERFACES BETWEEN THE ORBITER AND THE T-0 UMBILICALS AND THE ORB/ET DISCONNECTS.

2) TIMING OF ORB/ET DISCONNECT VALVES.

3) VERIFICATION OF LOZ/LHO ORBITER/ET DISCONNECT CAVITY PURSES.

<u>Personnel</u> :	<u> Mead Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	Ø. 2	NZA		
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	Ø	0.0	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	Ø	Ø.Ø	N/A		
Engineerings	Ø	Ø. Ø	N/A		
<u>Total</u> :	Ø	Ø.Ø		<u>Time</u> :	9.0

Issues: MAINTAINABILITY : DESIGN :

Technology Need Description:

				<u>je Count</u> : 182 ING LO2 AND LH2
(COMBINED LOADING) (LPS)	and an elementary arms to recorded to deep to make a transfer the recognition on			
<u>Subtask OMI(s)</u> : SEE PARA 1.1.	.s, FUR LIST	UF , 35	SEPARATE ,	SUBTASK UMI S ,
3	5	•	7	7
5	7	ÿ	,	
<u> Prerequisite Task OMI:</u>				
				ort Required: Y
<u>GSE</u> : C72- 0 811 , S 70-0 8;				2 0 ,
S7 0 -1222 , S72-0694-6	, 572 -0 69	97-3 ,	572 -0 699-2	

Activity Description: PROVIDE THE NECESSARY STEPS TO SERVICE THE LO2 AND LH2 FCSS/PRSD DEWARS FOR SUBSEQUENT ORBITER PRSD CRYD LOADING OPERATION. THIS NEW OMI WILL BE USED FOR INITIAL SYSTEM VALIDATION OF THE S70-0817 SYSTEM (PAD B) AND SUBSEQUENT OPERATIONAL SERVICINGS OF THE ORBITER PRSD SYSTEM (PAD A AND PAD B).

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	Ø	ଅ.ଅ	NZA		
Elec. Tech:	Ø:	Ø. Ø	N/A		
Guality:	(**)/3 (***)	Ø.Ø	NZA		
LCC Ope:	(Z)	Ø.Ø	NZA		
Suppert	Ø	Ø . Ø	N/A		
Engineerings	2	Ø. Ø	NZA		
Total:	Ø	ଡ.ଡ		Time:	7.0
<u>Inglet</u> i	Ę		2		17 85

Technology Need Description:

<u>Seq. Task No:</u> 213.000

Facility: FAD <u>OMI Page Count:</u> 2487

OMI Title: SHUTTLE COUNTDOWN (LPS)

Subtask OMI(s): SEE PARA 1.1.3, FOR LIST OF , REQUIRED , SUBTASK OMI'S ,

,

Frerequisite Task OMI:

OMI No: 50007741-4

Hazard: Y Level: Vehicle Power Required: Y LCC Support Required: Y SSE: S70-0508-C,R , Z70-0018-5 , A70-0719 , S70-1220 , S70-1228-01,-02, S72-1107-01 , S70-1232 , S70-0613

7

Activity Description: 1) TO PROVIDE THE SEQUENCE OF OPERATIONS REQUIRED TO PREPARE THE SHUTTLE FOR LAUNCH.

2) TO SERVICE CERTAIN PROPELLANTS AND GASES TO THE SHUTTLE FOR LAUNCH.

3) TO LAUNCH THE SHUTTLE:

4) TO PERFORM INITIAL PAD SAFING AFTER LAUNCH.

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
Mech. Tech:	Ø	Ø.Ø	N/A		
Elec. Tech:	Ø	Ø.Ø	N/A		
Guality:	Ø	Ø. Ø	N/A		
LCC Ops:	Ø	\varnothing . \varnothing	N/A		
Support:	<u></u>	Ø.Ø	N/A		
Engineerings	Ø	\varnothing . \varnothing	NZA		
Total:	Ø	Ø. Ø		Time:	6Ø.Ø

Issues:

Technology Need Description:

OF POOR QUALITY

Technology Identification Sheet

<u>Seq. Task No:</u> 30 <u>OMI No</u> : N0133 (LPS)		<u> Facility</u> : <u>OMI Title</u> :	PAD SHUTTLE	- CARGO	OM1 Page INSTALL	<u>Count:</u> ATION CONT	84 ROL
· · · · · · · · · · · · · · · · · · ·	160 510	, E1519 , N5033 , V3545	, 1	E1933 N5433 V5045	•	E5506 V1173 V9023	,
<u>Hazard: Y Level:</u> <u>GSE</u> :	<u>,</u>	ehicle Fowe	er Require	<u>ed</u> : Y <u>L</u>	CC Suppor	rt Require	<u>d</u> : Y

Activity Description: PROVIDE THE INTEGRATION CONTROL OF THE TRANSFER OF PAYLOADS TO THE PAD, PAYLOAD INSTALLATION IN THE PCR AND PAYLOAD INSTALLATION IN THE ORBITER.

(IUS EXAMPLE)

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	Ø. Ø	N/A		
Elec. Tech:	Ø	Ø.Ø	NZA		
<u>Quality</u> :	Ø	Ø.Ø	N/A		
<u>LCC Ops</u> :	\mathcal{Q}	0.0	N/A		
<u>Support</u> :	Ø	0.0	N/A		
<u>Engineering</u> :	C	ଅ.ወ	NZA		
<u>Total</u> :	Ø	Ø.Ø		Time:	80.0
Temento suco e	_				

<u>lesueg:</u>

Technology Need Description:

Eacility: PAD 301.000 OMI Fage Count: 104 Seq. Task No: OMI Title: CARGO/ORBITER INTERFACE TEST (LPS) OMI No: NØ433 (IUS EXAMPLE) , 59001 , S35**00** , V3528 <u>Subtask OMI(s)</u>: A2700 , EO433 , EØ233 V1117 , V1184 <u> Prerequisite Task OMI:</u> Vehicle Power Required: Y LCC Support Required: Y Hazard: Y Level:

Activity Description: SUPPORT MDAC PAYLOAD AS REQUIRED DURING P/L CHECKOUT.

	and the first and the	Man Hou<u>rs</u>	Remarks		
<u>Personnel</u> :	<u>Head Count</u>	0.0	N/A		
<u>Mech. Tech</u> :	Ø				
Elec. Tech:	Ø	Ø. Ø	NZA		
Guality:	₹Ø	Ø.Ø	N/A		
LCC Ops:	(2)	Ø.Ø	NZA		
	Ö	Ø.Ø	N/A		
<u>Support</u> :	2	0.0	NZA		
Engineering:		0.0		Time:	26.0
Total:	Ø	21, 20		<u> </u>	
	_				

<u>Issues</u>:

GSE:

Technology Need Description:

CRIMINAL PAGE IS OF POOR QUALITY

Technology Identification Sheet

<u>Seq. Task No</u> : 302.000 <u>OMI No</u> : N0131		PAD PAM EXAMPLE	<u>OMI Page Count</u> : (2
Subtask OMI(s):	5	,	,	5
y	•	•	7	*
,	5	5	•	
<u>Prerequisite Task OMI:</u>				
<u>Hazard:</u> N <u>Level</u> :	Vehicle Power	<u>r Required:</u> N	LCC Support Required:	: N
<u>GSE</u> :	,		•	
5	5	,		

Activity Description: PAM

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	<u>Remarks</u>		
Mech. Tech:	Q)	Ø.Ø	N/A		
Elec. Tech:	Ø	0.0	N/A		
Quality:	\mathbf{C}	0.2	N/A		
LCC Ops:	€ 2	Ø.Ø	NZA		
Support:	(2)	Ø. Ø	N/A		
Engineering:	<u>(2)</u>	Ø.Ø	N/A		
Total:	Ø	0.0		Time:	51.0
<u>Issues</u> :	:		:		2

Technology Need Description:

<u>Sec. Task No:</u> 303. OMI No: N0431	900 <u>Facility</u> : OMI Title:	PAD CARGO/ORBITER	OMI Page Count: 94 INTERFACE TEST (LPS)	
(PAM EXAMPLE) Subtask OMI(s): E043	1 , E1528	, E1543	, S3 500	,
59001 , V111	7 , V3528	, V9001	,	,
•	5	7	•	
<u>Prerequisite Task Or</u>				
<u>Hazard:</u> Y <u>Level</u> :	<u>Vehicle Fow</u>	<u>er Required:</u> Y	LCC Support Required:	Y
<u>GSE: C70-0</u> 727	•		9	

Activity Description: SUPPORT MDAC PAYLOAD AS REQUIRED DURING P/L CHECKOUT. (PAM EXAMPLE)

Personnel:	<u>Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	Ø	0.0	N/A		
Elec. Tech:	2	Ø.Ø	NZA		
Quality:	C	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	Ø	Ø.Ø	N/A		
Engineering:	(2)	0.2	N/A		
Total:	Ø	Ø.Ø		Time:	12.0
Issues:	:		:		:

Technology Need Description:

ORIGINAL PAGE IS OF POOR OUALITY

Technology Identification Sheet

<u>Seg. Task No</u> : 304.000 <u>OMI No</u> : N0130	Facility: OMI Title:	PAD SPACELAB EXA	<u>CMI Page Count</u> : MPLE	Ø
<u>Subtask OMI(s)</u> :	5	,	,	1
5	7	7	5	
Prerequisite Task OMI:	۲	,	1	
Hazard: N Level:	<u>Vehicle Powe</u>	er Required: N	LCC Support Require	<u>:d:</u> N
<u>GSE</u> : ,	•		,	

Activity Description: SPACELAB

<u>Personnel</u> :	Head Count	Man Hours	Remarks		
<u>Mech. Tech</u> :	<u>@</u>	Ø.Ø	N/A		
<u>Elec. Tech</u> :	Ø	Ø. Ø	NZA		
<u>Quality</u> :	Ø	Ø.Ø	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support:</u>	Ø	0.0	N/A		
Engineering:	C)	0.0	NZA		
<u>Total</u> :	Ø	0.0		Time:	0.0

<u>Issues</u>:

Technology Need Description:

Facility: PAD OMI Page Count: 0
OMI Title: -CARGO/ORBITER INTERFACE TEST (LPS) <u>Seq. Task No</u>: 305.000 OMI No: NØ430 (SPACELAB EXAMPLE)

<u>Subtask OMI(s)</u>:

Frerequisite Task OMI:

<u>Vehicle Power Required: N LCC Support Required: N</u> Hazard: N Level:

GSE:

Activity Description: SPACELAB

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	63	Ø . Ø	NZA		
Elec. Tech:	<i>2</i> 3	Ø.Ø	NZA		
Guality:	Q:	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	NZA		
Support:	Ø	2.0	N/A		
Engineering:	77 4	₽.0	N/A		
Total:	Ø	Ø.Ø		Time:	Ø.Ø

<u> Issues</u>:

Technology Need Description:

ORIGINAL PAGE IS OF POOR QUALITY

Technology Identification Sheet

<u>Seq. Task No</u> : 401.200	Facility: ET C/O CELL	<u>OMI Page Count</u> : 371
<u>OMI No</u> : T5149	OMI Title: ET OFF-LOAD M	OVE AND SECURE IN
CHECKOUT/STORAGE CELL		
<u>Subtask OMI(s)</u> : Q3 0 16	, 12 0 03 , 12 0 45	, 12047
Q3 00 8 , Q3 0 11	, 03208 · , 03235	, Ti102
T1103 , T5128	, T5148	7
<u>Prerequisite Task OMI:</u>		
The state of the s	<u>Vehicle Fower Required:</u> N	LCC Support Required: N
<u>GSE</u> : H78- 0 839-2 , H78- 0 8	•	, H78-3 00 6 ,
H78-3 0 28 , H78-3 0 40	, M78 -00 63 ,	

Activity Description: ET BARGE OFF-LOAD, MOVE TO VAB, REMOVE FROM TRANSFORTER, TRANSLATE TO VERTICAL AND INSTALL IN THE ET CHECKOUT/STORAGE CELL.

<u>Personnel</u> :	<u> Head Count</u>	<u>Man Hours</u>	<u>Remarks</u>		
Mech. Tech:	Ø	Ø. Ø	N/A		
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	Ø	2.0	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	Ø	Ø.Ø	NZA		
Engineering:	iZ.	Ø.0	N/A		
Total	Ø	Ø.Ø		Time:	24.0
V came a service •	:		4		:

<u>193405</u>:

Technology Need Description:

Seq. Task No: 402.000	Facility:	ET C/O CELL	<u>OMI Page Co</u>	<u>unt</u> : 206
<u>OMI No</u> : T5128	OMI Title:	PREF ET CHECK	OUT CELL/STOR	AGE CELL-
HB-2				
<u>Subtask OMI(s)</u> :	,	,	,	5
7	• 1	•	,	•
5	5	5	7	
<u> Prerequisite Task OMI</u> :				
<u>Hazard:</u> Y <u>Level</u> :	<u>Vehicle Pow</u>	<u>er Required</u> : N	LCC Support	Required: N
GSE:	á		•	,

Activity Description: PLACE CHECKOUT/STORAGE CELL IN CONFIGURATION NECESSARY FOR RECEIFT AND INSTALLATION OF AN ET.

Personnel:	Heed Count	Man Hours	Remarks		
Mech. Tech:	Ø:	Ø. Ø	NZA		
Elec. Tech:	Ũ)	Ø.Ø	NZA		
Quality:	⊘	Ø.Ø	N/A		
LCC Ops:	Ø	0.0	N/A		
Support:	(2)	Ø.Ø	NZA		
Engingering:	Ø	Ø.0	N/A		
<u>Total</u> :	Ø	0.0		Time:	8.0
lssues:	11 B		:		17 28

Technology Need Description:

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Technology Identification Sheet

<u>Seq. Task No</u> : 403.000	Facility:	ET C/O CELL	OMI Page Co.	<u>ınt</u> : 114
<u>OMI No:</u> T1102	OMI Title:	LO2 TANK PREP	S, PURGE,PRESS	SURIZATION
AND SAMPLING				
<u>Subtask DMI(s)</u> : T1101	, T2001	•	•	5
5	,	,	•	,
g g	•	,	,	
<u> Prerequisite Task OMI</u> :				
<u>Hazard:</u> Y <u>Level</u> :	Vehicle Fower	<u>r Required:</u> N	LCC Support R	Required: N
<u>GSE</u> :	•		,	,
•	,	•		

Activity Description: TO REMOVE SHIPPING AND STANDBY PRESSURIZATION GSE AND REPRESSURIZE THE LOZ TANK, IF REQUIRED, TO LEAK TEST AND STANDBY PRESSURE LEVELS. TO INSPECT THE 2 IN. DISCONNECT. TO SAMPLE THE LOZ TANK FOR DEW POINT.

<u>Fersonnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Elec. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Quality</u> :	Ø	Ø.Ø	N/A		
LCC Ops:	C !	Ø.Ø	NZA		
<u>Support:</u>	Ø	Ø. Ø	NZA		
<u>Engineering:</u>	(2)	න.න	N/A		
<u>Total</u> :	₹	Ø.Ø		Time:	20.0
Issues:	ŧ		r.		# 6

Technology Need Description:

Facility: ET C/O CELL OMI Page Count: 102 OMI Title: LH2 TANK PREPS, PURGE, PRESS AND Seq. Task No: 404.000 OMI No: T1103 SAMPLING , T2001 <u>Subtask OMI(s)</u>: T1101

Frerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: TO REMOVE SHIFFING AND STANDBY PRESSURIZATION GSE AND REPRESSURIZE THE LHZ TANK, IF REQUIRED, TO LEAK TEST AND STANDBY PRESSURE LEVELS. TO INSPECT 2 IN. AND 4 IN. DISCONNECTS. TO PURGE THE LH2 TANK WITH GHE, REPRESSURIZE AND SAMPLE FOR PERCENT HELIUM AND DEW POINT.

Personnel:	Head Count	<u>Man Hours</u>	Remarks		
Mech. Tech:	<u>(/)</u>	0.0	N/A		
Elec. Tech:	(∆	Ø.Ø	N/A		
Quality:	2)	Ø.Ø	N/A		
LCC Ops:	Ž	Ø.Ø	N/A		
Support:	Ź:	Ø.Ø	NZA		
Engineering:	Ø.	0.0	N/A		
Total:	Ø	Ø. Ø		Time:	20.0
grad to diagno replacement de la Communicación					
<u>Issues</u> :	ī.		n v		;

Technology Need Description:

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Technology Identification Sheet

<u>Sec. Task No</u> : 405.000 <u>OMI No</u> : T6149		ET C/O SELL ET RECEIVING		34
Subtask OMI(s):	\$	y	,	,
7	,	,	•	,
; <u>Prerequisite Task OMI</u> :	÷	y	,	
<u> Hazard: N Level:</u>	<u> Vehicle Powe</u>	r Required: N	LCC Support Required	Iz N
<u>89E</u> : A72- 0 853 , A	78-0856 . A			**

Activity Description: TO PROVIDE NECESSARY DETAILED INSTRUCTIONS TO PERFORM RECEIVING INSPECTION ON EACH EXTERNAL TANK (ET), ITS ASSOCIATED SHIP-LOGGE HARDWARE AND ENGINEERING CONFIGURATION VERIFICATION AFTER ARRIVAL AT KSC.

<u>Fersonnel</u> :	Head Court	Man Hours	Regarks		
<u>Mech. Tech</u> :	Ø	Ø.Ø	N/A		
<u> Eleca leun</u> :	Ø	Ø.Ø	NZA		
<u>Quality</u> :	Ø	Ø. Ø	N/A		
<u>LCC Cps</u> :	22	Ø.Ø	NZA		
<u>Support</u> :	(2)	0.0	N/A		
<u>Endineering</u> :	C.	Ø.Ø	NZA		
Totals	Ø	Ø Ø		Time:	42.Ø

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Technology Need Description:

<u>Technology Identification Sheet</u>

<u>Sco. Task No</u> : 424.822 <u>OMI No</u> : T5 048	<u>Sacility</u> OMI Tit	/: ET C/O CELL Le: INSTALL AND	OMI Page Count REMOVE INTERTANK	L: 178 ACCESS
KIT			n.	5
<u>Subtask DMI(s)</u> : 76447	•	,	,	· ·
7	9	7	•	;
,	,	5	5	
Prerequisite Task OMI:				
Hazard: N Level:		Power Required: N	LCC Support Re	<u>quired:</u> N
GSE: A72-0853 , A76	-3604	, A78-3605	,	7

Activity Description: INSTALL INTERTANK ACCESS KIT AND RELATED EQUIPMENT. REMOVE INTERTANK ACCESS KIT AND RELATED EQUIPMENT.

Personseli	Hasi Count	Man Haurs	Remarks		
Mect. Tell	₹0	\varnothing . \varnothing	NZA		
Elec. Test.	.7.	Ø.9	NZA		
Coleran	e⊤. Vez	②.②	NZA		
LOD Oper	Z*	Ø. Ø	N/A		
	A.*	Ø. O	NZA		
Engineerings	Q i	Ø . Ø	N/A		
Total:	Ġ:	Ø. Ø		Time:	32.0
Issues:	•		:		ť

Technology Need Description:

Technology Candidates Identified:

ORIGINAL PAGE IS

Activity Description: TO PERFORM A VISUAL EXAMINATION FOR DAMAGE AND DEGRADATION, FLIGHT CERTIFICATION, AND ELECTRICAL CHECKOUT PRIOR TO PLACING DEVICES IN STORAGE. TO CONDUCT PREINSTALLATION INSPECTION AND PERFORM FLIGHT BOX BUILDUP.

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	Ø . Ø	N/A		
Elec. Tech:	Ø	Ø.Ø	NZA		
<u>Quality</u> :	Œ	0.0	N/A		
<u>LCC Ops</u> :	2)	Ø.Ø	N/A		
<u>Support:</u>	Ø	Ø.Ø	N/A		
<u>Engineerino</u> :	2)	Ø.Ø	N/A		
<u>Total</u> :	Ø	Ø.Ø		Time:	16.0
Issues:	•		<u>.</u>		,

Technology Need Description:

r * ; : .

<u>Seg. Task No</u> : 402.000 <u>OM1 No</u> : T6148	Facility: OMI Title:	ET C/O CELL GUCP AND GUCP	OMI Page Court: GUICK DISCONNECT	156 POST
LAUNCH REFURBISHMENT				
<u>Subtask OMI(s)</u> :	y	,	•	,
"	•	,	,	,
,	,	,	•	
<u>Prerequisite Task OMI:</u> Hazard: N <u>Level</u> :	<u>Vehicle Fow</u>	<u>er Required</u> : N	LCC Support Requi	<u>red</u> : N
<u>GSE: A78-3621</u> , F7	2- 00 48 ,		,	1
		9		

Activity Description: TO REFURBISH/LEAK TEST GROUND HALF OF GUPC QUICK DISCONNECT, ONE 7 IN. GH2 VENT AND SIX 3/8 IN. PRESSURIZATION QUICK DISCONNECTS AFTER LAUNCH.

Personnel:	Head Count	Man Hours	Remarks		
mech. lech:	(7)	∅.∅	N/A		
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	Ø	20.00	NZA		
LCC Obs:	2)	Ø. Ø	, N/A		
Support:	6 25	Ø. Ø	N/A		
Engineering:	124	Ø. Ø	N/A		
Total:	Ø	0.0		Time:	96.0
C see Your Control of the Control of					

Issues:

Technology Need Description:

Technology Candidates Identified:

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Technology Identification Sheet

<u>Seg. Task No:</u> 409.000 <u>OMI No</u> : T1109 •	<u>Facility:</u> <u>OMI Title</u> :	ET C/O CELL LH2/LO2 TANK	OMI <u>Page Count</u> : 2 LEAK TEST	7
Subtask OMI(s):	,	,	5	
9	•	7	•	,
; <u>Frerequisite Task</u> OMI:	5	,	5	7
Hazard: N Level: GSE: A72-0853 A78		er Required: N	110000	: N
5	, ,	A78-36 0 4	, C78-1229 ,	

Activity Description: TO VERIFY THAT LEAKAGE OF THE PENETRATIONS, FLANGES AND CLOSURES OF THE ET LH2/LO2 WHICH ARE DIRECTLY EXPOSED TO TANK PRESSURE IS WITHIN SPECIFICATIONS.

<u>Personnel</u> :	Head Count	Man Hours	Remarks		
<u>Mech. Tech</u> :	Z	0.0	N/A		
Elec. Tech:	(2)	Ø.Ø	NZA		
<u>Guality</u> :	2	Ø.Ø	N/A		
<u>LCC Ops</u> :	Ø	Ø. Ø	NZA		
<u>Support</u> :	Ø	0.0	N/A		
Engineering	$ ot\!$	Ø.Ø	N/A		
<u>Total</u> :	Ø	Ø.Ø		Time:	40.0
Issues:	· *				

Technology Need Description:

Activity Description: INSTALL AND MECHANICALLY CONNECT THE INTERTANK (I/T) GUCF TO THE ET AND TO THE CHECKBUT CELL FACILITY SERVICES.

Personnel:	head Count	Man Hours	<u>Remarks</u> N/A		
Mech. Tech: Flec. Tech:	⊘ Ø:	ଡ.ଡ ଡ.ଡ	N/A		
Quality:	Ü	0.0 0.0	N/A N/A		
<u>LCC Ops</u> : • Support:	⊘ ⊘	Ø.0 Ø.0	NZA		
Engineering:	Ø Ø	0.0 0.0	N/A	Time:	48.0
<u>Total</u> :	₩)	Q140			

Issues:

Technology Need Description:

Technology Candidates Identified:

Seq. Task No: 411.000 Facility: ET C/O CELL OMI <u>Page Count</u>: 136 OMI No: T1107 OMI Title: ET ANCILLARY LEAK AND FLOW TEST (HB-2)<u>Subtask OMI(s)</u>: T1101 , T1103 , T1102 Prerequisite Task OMI: <u>Hazard:</u> Y <u>Level</u>: <u> Vehicle Power Reguired: N. LCC Support Required:</u> N <u>GSE</u>: C78-1229 , C78-52**0**2 ,

Activity Description: PROVIDE THE PROCEDURES FOR LEAK TESTING THOSE ET LINES AND COMPONENTS WITHIN THE INTERTANK NOT DIRECTLY EXPOSED TO LOZ AND LHZ TANK

INTERNAL PRESSURE AND FOR VERIFYING FLOW IN INTERTANK PURGE, AND NOSE FAIRING

PURGE SYSTEM.

<u>Personnel</u> :	Head Count	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	2	Ø.0	N/A		
<u>Elec. Tech</u> :	Ø	0.0	NZA		
$\underline{\texttt{Guality}}$:	V	Ø. Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø.0	N/A		
<u>Support</u> :	Ø	Ø.Ø	NZA		
<u>Encineering:</u>	Ø	Ø.0	NZA		
<u>Total</u> :	Ø	Ø.Ø		Time:	56.0
<u>Issues</u> :	2		;		£

Technology Need Description:

Seq. Task No: 412.000 OMI No: T5143 COMEONENTS	Facility: OMI Title:	ET C/O CELL INSTALL ET	OMI Page Count: 1 RANGE SAFETY SYSTEM	7
			•	*
Subtask OMI(s):	y	,	· -	4
ÿ	•	•	7	
9	,	,	•	
Prerequisite Task OMI: Hazard: N Level:	<u>Vehicle Pow</u>	er Required:	N LCC Support Required	: N
<u>99E</u> :	,		,	

Activity Description: TO INSTALL ET RANGE SAFETY SYSTEM FLIGHT COMPONENTS PRIOR TO SRSS FUNCTIONAL TESTING.

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	<u>()</u>	Ø.Ø	N/A		
Elec. Tech:	Ø	0.0	N/A		
Quality:	Q	Ø.ø	N/A		
LCC Ops:	Ø	Ø.Ø	NZA		
Support:	Ø	Ø.0	NZA		
<u>Engineering</u>	£.	Ø.Ø	NZA		
Total:	Ø	Ø.Ø		<u>Time</u> :	8.0
•	12		:		:

<u>Issues</u>:

Technology Need Description:

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Technology Identification Sheet

Seq. Task No: 413.000 Facility: ET C/O CELL OMI Page Count: 162
OMI No: T5142 OMI Title: SRSS ORDNANCE INSTALLATION

Subtask OMI(s): Ti104 , Ti107

Prerequisite Task OMI:

Hazard: Y Level: Vehicle Power Required: N LCC Support Required: N

GSE: A78-0856 , M78-0077-1 , M78-0077-2 ,

Activity Description: INSTALL AND CONNECT THE ET SRSS LINEAR SHAPED CHARGE (LSC) IN LOZ AND LHZ CABLE TRAYS. MECHANICALLY INSTALL SAFE AND ARM DEVICE. INSTALL LOZ/LHZ RUBBER DAMS AMD CABLE TRAY COVERS.

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech</u> :	(2)	0.0	N/A		
Elec. Tech:	Ø	0.0	NZA		
<u>Cuality</u> :	Ø	Ø.Ø	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	NZA		
<u>Support</u> :	Ø	2 0.0	147 A		
<u>Engineering</u> :	₽ñ	ా. Ø	N/A		
<u>Total</u> :	Ø	0.2		<u>Time</u> :	24.0

<u>Issues:</u>

Technology Need Description:

SEE TIS 11 (V5012)

Technology Candidates Identified:

SEE TIS 11 (V5012)

Seq. Task No: 414,000 Facility: ET C/O CELL DMI Page Count: 70
OMI No: T1145 OMI Title: PURGE BARRIER SEAL INSTALLATION

Subtask OMI(s):

Prerequisite Task DMI:

Hazard: N Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: INSTALL PURGE BARRIER SEALS AND INSPECT UMBILICALS.

Personnel:	Head Count	Man Hours	<u>Remarks</u>		
Mech. Tech:	V.	Ø.Ø	N/A		
Elec. Tech:	②)	2.2	N/A		
Chality:	2	Ø. Ø	N/A		
	2	Ø.Ø	N/A		
<u>LCC Ops</u> :	2	Ø. Ø	N/A		
<u>Support</u> :	<u></u>	Ø. Ø	NZA		
<u>Engineering:</u>		Ø. Ø		Time:	64.0
<u> Total</u> :	Ø	53 # 8 0			

<u>Issues</u>:

Technology Need Description:

<u>Seq. Task No</u>: 415.000 OMI No: T5141

Facility: ET C/O CELL OMI Page Count: OMI Title: TPS CLOSEOUT, AFT HARDPOINT

82

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: Y Level:

<u>Vehicle Power Required:</u> N <u>LCC Support Required:</u> N

GSE:

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LH2 TANK SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT AFT HARDPOINT CLOSEOUT AND AFFLY POLYURETHANE FOAM.

<u>Fersonnel</u> :	Head Count	Man Hours	Remarks		
<u>Mech. Tech:</u>	Ø	0.0	N/A		
Elec. Tech:	©	0.0	N/A		
<u>Quality</u> :	Ø	0.0	N/A		
<u>LCC Ops</u> :	Ø	۵.0	N/A		
<u>Support:</u>	Ø	Ø. Ø	N/A		
Engineering:	<i>Q</i> :	Ø. Ø	N/A		
<u>Total</u> :	Ø	Ø. Ø	147 54	<u>Time</u> :	24.0

Issues:

Technology Need Description:

<u>Seg. Task No</u> : 416.000 <u>OMI No</u> : T5136	Facility: OMI Title:	ET C/O CELL TPS CLOSEOUT,	OMI Fage Count: 64 HELIUM INJECT LEAK	
CHECK PORTS			•	,
Subtask OMI(s):	7	,	•	,
*	?	*	, -	
*	•	7	7	
<u> Prerequisite Task OMI:</u> <u>Hazard: N Level</u> :	Vehicle Pow	ver Required: N	LCC Support Required:	N
GSE:	,	•	,	

Activity Description: PERFORM NECESSARY TASKS TO PREPARE LO2 FEEDLINE SUBSTRATE, AND EXISTING THERMAL PROTECTION SYSTEM FOR APPLICATION OF POLYURETHANE FOAM L744A.

Personnel:	<u>Head Count</u> Ø	Man Hours Ø.Ø	<u>Remarks</u> N/A		
<u>Mech. Tech:</u> <u>Elcc. Tech</u> :	Ø Ø	Ø. Ø Ø. Ø	N/A N/A		
<u>Quality</u> . <u>LCC Ops</u> :	20	Ø. Ø Ø. Ø	N/A N/A		
<u>Support:</u> <u>Engineering</u> :	\(\tilde{\alpha} \)	Ø. 0 Ø. 0	N/A	Time:	15.0
<u>Total</u> :	€)	47 2 43			1

Issues:

Technology Need Description:

Seg. Task No: 417.000 Facility: ET C/O CELL OMI Page Count: 66
OMI No: T5238 OMI Title: TPS CLOSEOUT, HELIUM INJECT BOX

Subtask OMI(s):

Prerequisite Task OMI:

Hazard: N Level:

GSE:

<u>Vehicle Power Required:</u> N <u>LCC Support Required:</u> N

Activity Description: PERFORM NECESSARY TASKS TO PREPARE SUBSTRATE AND EXISTING THERMAL PROTECTION SYSTEM AT HELIUM INJECT BOX CLOSEGUT AND APPLY L744A POLYURETHANE FOAM.

<u>Personnel</u> :	<u>Head Count</u>	Man Hours	Remarks		
<u>Mech. Tech:</u>	<u>@</u>	0.0	N/A		
<u>Elec. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Quality</u> :	€	Ø.Ø	N/A		
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support:</u>	Ø	0.0	N/A		
Engineering:	Ø	Ø. Ø	N/A		
<u>Total</u> :		Ø.Ø		Time:	16.0
Teeree.	_				

<u>Issues</u>:

Technology Need Description:

Technology Candidates Identified:

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<u>Seq. Task No</u> : 418.000 <u>OMI No</u> : T1101 8833	Facility: OMI Title:	ET C/O CELL GH2/GO2 VENT	OMI Page Count: 1 VALVE FUNCTIONAL TES	47 T-
			•	
Subtask <u>OMI(s)</u> :	5	,	•	
		,	ž	,
•	7			
•	5	,	7	
<u>Prerequisite Task OMI:</u> <u>Hazard: Y Level:</u> <u>GSE:</u> C78-1229 , C78	<u>Vehicle Pov</u> -1273 ,	ver Required: N C78-1273-32	LCC Support Require	<u>d</u> : Y
ŋ	7	*		

Activity Description: TO VERIFY THAT THE GH2/GO2 VENT VALVES OPEN AND CLOSE WITHIN THE SPECIFIED TIMES, AND THAT THE VALVES CRACK AND RESEAT WITHIN THE SPECIFIED PRESSURES. TO LEAK CHECK THE GH2/GO2 VENT VALVE PILOT SENSE PORTS.

Personnel:	Head Count	Man Hours	Remarks		
Mech. Tech:	(<u>2</u>	Ø.Ø	N/A		
Elec. Tech:	Ky	Ø. 7	N/A		
Quality:	Ø	Ø.0	NZA		
LOC Ons:	ē	Ø.0	N/A		
Support:	(2)	Ø.Ø	NZA		
<u>Engineering:</u>	Ž	20.12	ANA		
Total:	Ö	Ø.Ø		Time:	20.0
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Issues:

Technology Need Description:

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Technology Identification Sheet

Seg. Task No: 419.000 Facility: ET C/O CELL <u>OMI Page Count: 303</u> OMI No: TII60 OMI Title: ET ELECTRICAL ALL SYSTEMS TEST HB-4/2

<u>Subtask OMI(s)</u>: T1101 , T1195

Prerequisite Task OMI:

<u>Hazard:</u> Y <u>Level</u>: Vehicle Power Required: Y LCC Support Required: Y

GSE:

Activity Description: TO PERFORM ELECTRICAL CIRCUIT INTEGRITY, MATE GSE CABLING, VERIFY RESISTANCE THRESHOLDS, LOAD LEVELS, ENERGY OUTPUTS, VERIFY SRSS AND ASSOCIATED SRB AND ORBITER ELECTRICAL INTERFACES, OPERATIONAL INSTRUMENTATION SYSTEM, TUMBLE SYSTEM, ET HEATER SYSTEM AND DISCONNECT ELECTRICAL AND GUCP PNEUMATICS GSE FROM ET PRIOR TO ET TRANSFER TO INTEGRATION CELL.

<u>Personnel</u> :	<u>Head Count</u>	<u>Man Hours</u>	Remarks		
<u>Mech. Tech</u> :	Ø	0.0	N/A		
Elec. Tech:	Ø	0.0	NZA		
Ω uality:	Ø	Ø.0	NZA		
<u>LCC Ops</u> :	Ø	Ø.Ø	N/A		
<u>Support:</u>	Ø	0.0	N/A		
<u>Engineering:</u>	Ø	Ø.Ø	NZA		
<u>Total</u> :	(2)	₩.W		Time:	72.0

Issues:

Technology Need Description:

Seg. Tack No: 420.000 Facility: ET C/O CELL OMI Page Count: 146
OMI No: T1108 OMI Title: LO2/LH2 DISCONNECT 17-IN. FLAPPER
VALVE MEASUREMENT, VERIFICATION AND INSPECTION-HB-2/-4 CHECKOUT CELL

Subtask OMI(s):

Frerequisite Task OMI: Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: MEASURE AND VERIFY THE ANGLE AND TIP LOAD OF THE LO2/LH2 17-IN. DISCONNECT FLAPPER VALVES. VERIFY THE FLAPPER VALVE FAIRING CONFIGURATION ON THE LO2/LH2 DISCONNECT VALVES. VERIFY THE PROPER TORQUE ON THE LO2/LHZ 17-IN. DISCONNECT FLAPPER VALVE STOPS.

2

ES and the second process of the	Head Count	Man Hours	Remarks		
<u>Personnel</u> :	(7)	2.6	NZA		
Mech. Tech:		Ø. Ø	NZA		
<u> Elec. Tech</u> :	Ø		N/A		
Quality:	<i>\$</i>)	Ø. Ø	• • • • •		
LCC Ops:	Q)	Ø.Ø	NVA		
	22	Ø.Ø	NZA		
Support:	<i>C</i> 3	Ø. Ø	N/A		
<u>Engineering</u> :				Time:	48.0
Total:	Ø	0.0			

Issues:

Technology Need Description:

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Technology Identification Sheet

Prerequisite Task OMI:
Hazard: N Level: Ve

Vehicle Power Required: N LCC Support Required: N

GSE:

Activity Description: TO PROVIDE DETAILED INSTRUCTIONS FOR PERFORMING INSPECTION OF EACH EXTERNAL TANK (ET), ET/ORBITER (ORB) INTERFACE AND ET/SOLID ROCKET BOOSTER (SRB) INTERFACE PRIOR TO MOVE OPERATIONS.

<u>Personnel</u> :	Head Count	Man Hours	Remarks		
Mech. Tech:	Q)	0.0	N/A		
<u>Elec. Tech</u> :	Ø	Ø.Ø	N/A		
<u>Quality</u> :	Ø	Ø.0	N/A		
<u>LCC Ops</u> :	Ø	0.0	NZA		
<u>Support:</u>	Ø	Ø.ø	N/A		
<u>Engineering</u> :	Ø	Ø.Ø	N/A		
<u>Total</u> :	Ø	Ø.Ø	, , ,	<u>Time</u> :	16.0

<u>Issues:</u>

Technology Need Description:

Prerequisite Task OMI:

Hazard: Y Level:

Vehicle Power Required: N LCC Support Required: N

SSE:

Activity Description: PLACE CHECKOUT/STORAGE CELL (VAB HB-2/-4) IN CONFIGURATION NECESSARY FOR RECEIPT AND INSTALLATION OF AN ET.

	Head Cou <u>nt</u>	Man Hours	Remarks		
Personnel:	(Z)	0.0	N/A		
<u>Mech. Tech</u> :	Ø	۵. _۵	N/A		
Elec. Tech:	·-	0.0	N/A		
<u>Quality</u> :	(Z)	0.0	N/A		
<u>LCC Ops</u> :	Ø	0.0	NZA		
<u>Support</u> :	<u>e</u>	Ø. Ø	N/A		
Engineering:	Ø		(4:11	Time:	6.0
Total:	2	Ø.Ø		1 2 111 22	

<u>Issues</u>:

Technology Need Description:

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Technology Identification Sheet

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Seq. Task No: 423.000	Facility:	ET C/O CELL	<u>OMI Page Count</u> : 17	5
OMI No: T5147	OMI Title:	ET MOVE FROM	STORAGE CELL TO CHECK	DUT
CELL/FROM CHECKOUT CELL TO	STORAGE CELL			
<u>Subtask OMI(s)</u> : I2003	, 12026	, ฌฺฃ๗ฅ	, অ১০০ ১	,
03 022 , 03 0 16	, 03235	, 5000 3	, T5128	•
T5148 , T6248	,	9	1	
<u>Prerequisite Task OMI</u> :				
<u>Hazard</u> : Y <u>Level</u> :		<u>er Required</u> : N		: N
<u>GSE</u> : H78-0839-2 , H78-0	•	H78-3 00 6	, H78-3 00 8 ,	
H78-3 0 28 , H78-3 0 40	, M78- 0	Ø63 ,		

Activity Description: MOVE ET FROM STORAGE CELL AND SECURE IN CHECKOUT CELL OR FROM CHECKOUT CELL AND SECURE IN STORAGE CELL.

Personnel:	<u>Head Count</u>	Man Hours	Remarks		
Mech. Tech:	Ø	Ø.Z	NZA		
Elec. Tech:	Ø	Ø.Ø	N/A		
Quality:	(2)	Ø. Z	NZA		
LCC Ops:	Ø	Ø.Ø	N/A		
Support:	2 :	Ø. Ø	NZA		
Engineering:	Ø	Ø.Ø	N/A		
Total:	2)	Ø.Ø		Time:	8.0
<u>Issues</u> :	:		:		:

Technology Need Description:

		-